# PUMA 2100/2600/3100 series

High-Performance Turning Center

Doosan Machine Tools

*Optimal Solutions for the Future*

# High-Performance Turning Center

PUMA 2100/2600/3100 series has been developed to create full line up of high level 8" to 12" size with model variations from 2 axis to Y axis and sub spindle.

# PUMA 2100/2600/3100 series

High Performance + Wide Variation + Easy Operation

2010 ~

**NEW PUMA series**

# High Performance

These Doosan machines offer a high level of machining capability to provide optimum productivity for the customer.

PUMA 2100/2600/3100 series

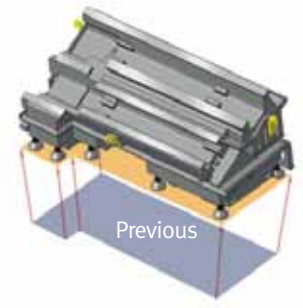
## Rigid Bed

Today's high speed / high acceleration, deceleration feed drives impose severe impact forces on the machine tool structure. This causes low frequency / large amplitude vibration which can cause deterioration in surface finish and contour definition during finish machining. Doosan's enhanced structural stability reduces the effects of vibration and provides the optimum conditions for producing unsurpassed workpiece quality.

Larger than previous

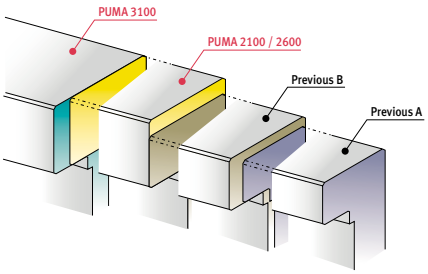
Max. **158 %**
(PUMA 2100 / 2600)

Max. **154 %**
(PUMA 3100)



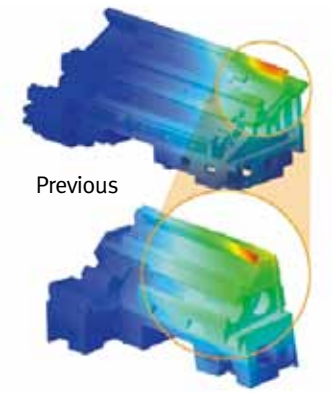

### Bed guide way width

For structural stability, the guide way width and span are enlarged by 25%~50%, so that high precision in cutting is ensured.

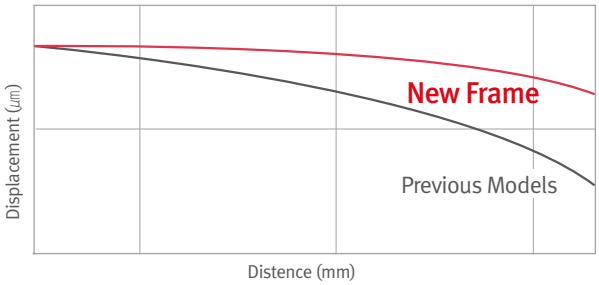



### Stiffness

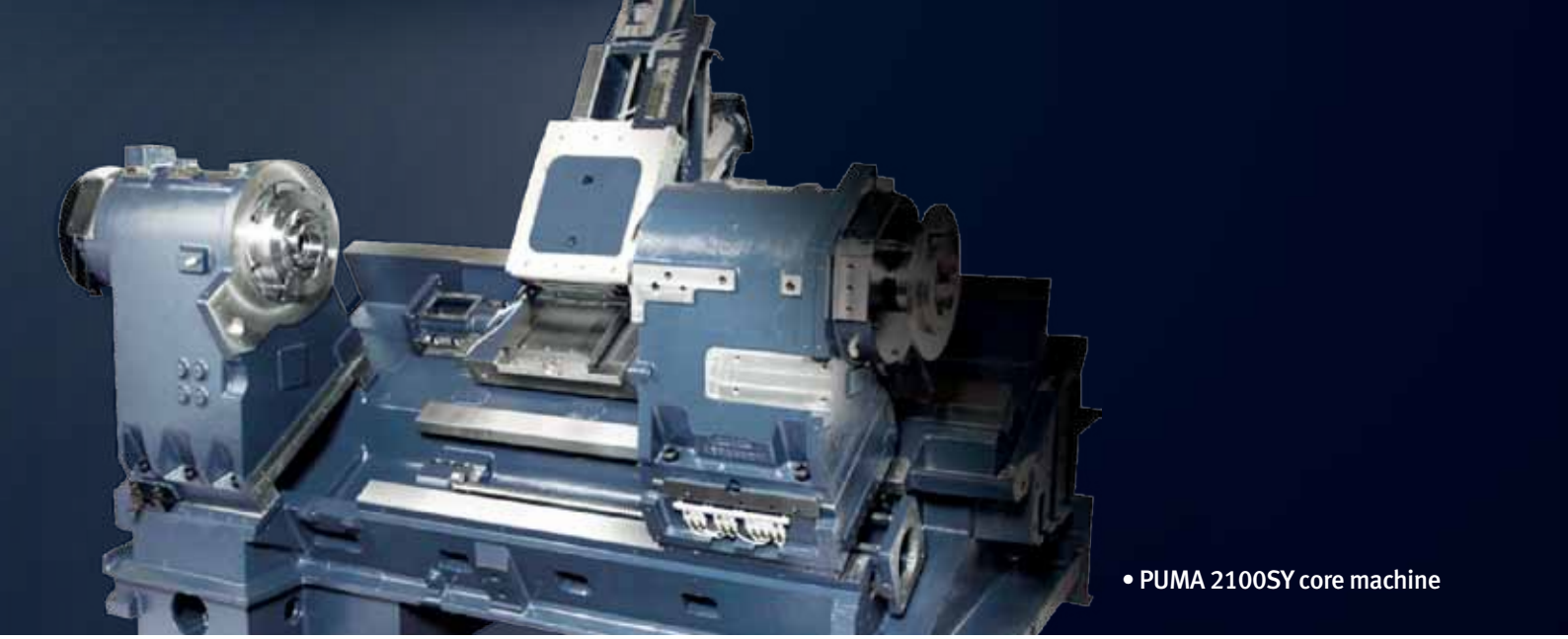
Static and Dynamic rigidity of the new PUMA 2100/2600/3100 machines have been enhanced in structural analysis compared with the previous model.




### Guide way deformation




Static stiffness is **3 times** higher than previous



• PUMA 2100SY core machine

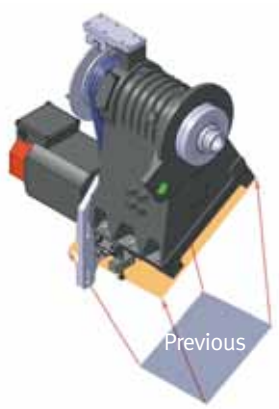
## Main Spindle

### Increased mounting area of headstock base to the bed

The spindle headstock has increased rigidity due to the wide surface contact between the headstock and bed way for Heavy duty cutting, Optimum surface finish, High cutting speeds, Highly accurate roundness.

larger area than previous

Max. **190 %**
(in the same class)




## Sub Spindle

Mounting base area is

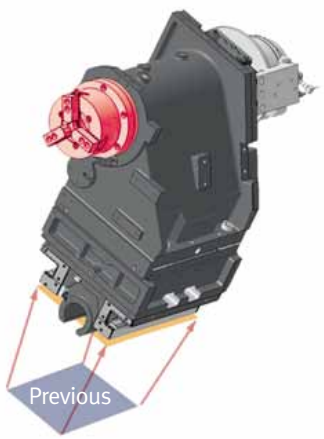
**50 % ~ 94 %**

larger than previous

Previous Model
135 / 170 mm
(5.3 / 6.7 inch)

Chuck size

PUMA 2100 / 2600
**175** mm
(6.88 inch)




## Tooling System (On Turn-Milling)

The turret accommodates BMT55P or BMT65P tooling in which the toolholders are mounted directly to the turret's periphery with 4 large bolts. This type of mounting system BMT55P is standard on PUMA2100 turn-milling models and BMT65P is standard on PUMA2600 and PUMA3100 turn-milling models. BMT65P is available on PUMA2100 as an option.

Max. rotary tool spindle speed

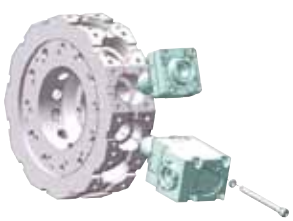
**5000** r/min

Max. rotary tool spindle power

**5.5** kW (7.3 Hp), 15 min.
{7.5 kW (10.1 Hp), 5 min.} opt.

Max. rotary tool spindle torque

**47** N·m (34.6 ft-lbs)
{95.5 N·m (70.4 ft-lbs)} opt.

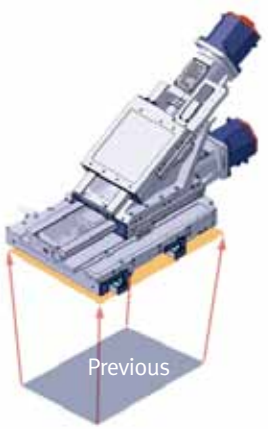


## Saddle

The broad width and long contact span of the saddle slideway ensures stability of the support structure. This coupled with the optimised spindle and bed design provides heavy duty and accurate machining capability.

**Saddle guide width and span are increased in a range from**

**Max. 30 % to 46 %**
**compared with previous**



# Machining Capacity

More powerful revolving motor is adapted to improve the productivity.

## End mill

Carbon steel (SM45C)

| | Unit | PUMA 2100 BMT55P | PUMA 2600 BMT65P |
|---|---|---|---|
| Chip removal rate | $cm^3$/min ($inch^3$/min) | 90 (35.43) | 105 (41.34) |
| Tool Dia. | mm (inch) | 18 (0.71) | 20 (0.79) |
| Cutting Depth | mm (inch) | 20 (0.79) | 21 (0.83) |
| Feedrate | mm/min (ipm) | 250 (9.8) | 250 (9.8) |

## Tapping

Carbon steel (SM45C)

| | Unit | PUMA 2100 BMT55P | PUMA 2600 BMT65P |
|---|---|---|---|
| Rotary tool spindle speed | r/min | 240 | 240 |
| Tap Size | | M20 x P2.5 | M24 x P3 |
| Feedrate | mm/min (ipm) | 600 (23.6) | 600 (23.6) |

## Face mill

Carbon steel (SM45C)

| | Unit | PUMA 2100 BMT55P | PUMA 2600 BMT65P |
|---|---|---|---|
| Chip removal rate | $cm^3$/min ($inch^3$/min) | 41.9 (16.49) | 53.9 (21.22) |
| Tool Dia. | mm (inch) | 63 (2.48) | 63 (2.48) |
| Cutting Depth | mm (inch) | 3.5 (0.14) | 4.5 (0.18) |
| Feedrate | mm/min (ipm) | 190 (7.5) | 190 (7.5) |

## O.D turning

Carbon steel (SM45C)

| | Unit | PUMA 2100 | PUMA 2600 |
|---|---|---|---|
| Chip removal rate | $cm^3$/min ($inch^3$/min) | 528 (207.87) | 616 (242.52) |
| Cutting Depth | mm (inch) | 4.3 (0.17) | 5.0 (0.2) |
| Feedrate | mm/rev (ipr) | 0.55 (0.022) | 0.55 (0.022) |

## U-Drill dia. 63 mm (2.5 inch)

Carbon steel (SM45C)

| | Unit | PUMA 2100 | PUMA 2600 |
|---|---|---|---|
| Chip removal rate | $cm^3$/min ($inch^3$/min) | 472 (185.83) | 630 (248.03) |
| Feedrate | mm/min (ipm) | 0.15 (0.006) | 0.2 (0.008) |

## Grooving

Carbon steel (SM45C)

| | Unit | PUMA 2100 | PUMA 2600 |
|---|---|---|---|
| Chip removal rate | $cm^3$/min ($inch^3$/min) | 169 (66.54) | 241 (94.9) |
| Cutting Depth | mm (inch) | 8 (0.31) | 8 (0.31) |
| Feedrate | mm/rev (ipr) | 0.14 (0.006) | 0.2 (0.008) |

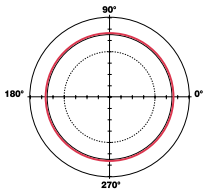
- The results indicated in this catalogue are provided as example.
  They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.
- Turing results are obtained in the condition of standard motor.

# Accuracy

Doosan offers its customers unsurpassed levels of accuracy by applying the latest design techniques and rigorous testing processes.

## Roundness

| | |
|---|---|
| Machine | PUMA 2600SY<br>[Belt-driven] |
| Tool | TNMG16404R-W<br>[Nose radius 0.4mm] |
| Workpiece | ø60 x L50<br>(ø2.4 x L2.0 inch)<br>Carbon steel [SM45C] |
| Spindle Speed | 3500 r/min |
| Cutting Depth | 0.025 mm (0.001 inch) |
| Feedrate | 0.025 mm/rev (0.001 ipr) |




**0.5µm**
(0.02 µinch)
test model
PUMA 2600SY

Users enjoy stable performance in all types of operations from heavy-duty cutting to high speed machining.

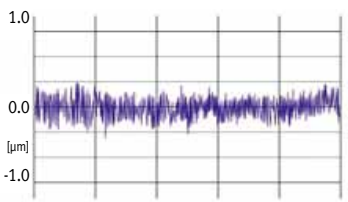
| | |
|---|---|
| Work material | Aluminum (AL2024) |
| Cutting speed | 250 (9842.5) m/min (ipm) |
| Feedrate | 0.08 (0.003) mm/rev (ipr) |
| Cutting depth | 0.2 (0.008) mm (inch) |
| Tool | Diamond [nose R0.8] |

## Roughness

**Ra 0.11µm**
(Ra 0.004 µinch)

**Rz 0.83µm**
(Rz 0.033 µinch)

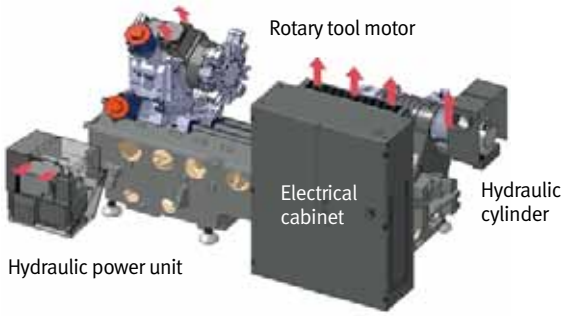
**Rmax 0.92µm**
(Rmax 0.036 µinch)




| | |
|---|---|
| Material | Carbon steel (SM45C) |
| Work Size | ø60 x L50 mm (ø2.4 x L2.0 inch) |
| Spindle speed | 3500 r/min |
| Feed | 0.025 mm/rev (0.001 ipr) |
| Depth | 0.025 mm (0.001 inch) |
| Holder | PTGNR2020 M16 |
| Insert | TNMG160404 R-W (R0.4) |

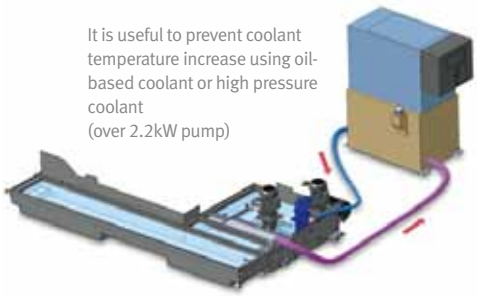
## Heat elimination layout

One very important design concept is to reduce the effects of heat sources in the machine. Heat shields and fan motors are used to prevent the transmission of heat to the machine structure.




## Coolant chiller opt.

Thermal displacement and dimensional accuracy are greatly influenced by oil temperature in a machine. Coolant Temperature Control unit prevents the coolant from heating. Especially, when using oil-based coolant, the oil temperature can become extremely high.




* Please contact Doosan in these cases

## Inertia estimates function for C-axis std.

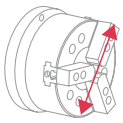
This function can estimate the C-axis inertia which is affected by variation in workpiece weight. It is possible to optimise the Velocity Gain and Acc/Dec Time Constant and therefore improve the C-axis accuracy.

# Wide Variation

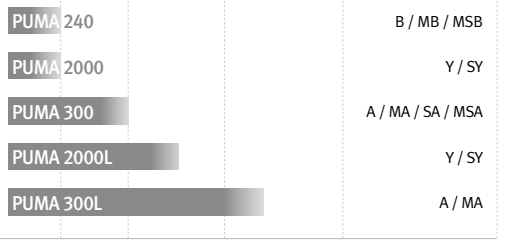
A wide variety of machine specifications from 2-axis models to turning centers with sub spindles is available to meet your production requirements.

PUMA 2100/2600/3100 series

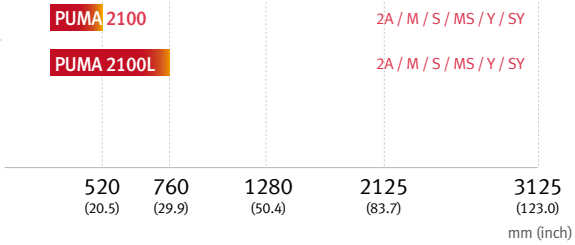
## Previous Model



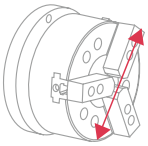
ø 210 mm
(8")



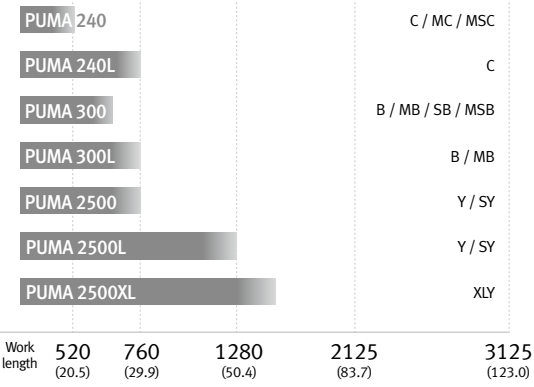

## PUMA 2100 / 2600 / 3100 series



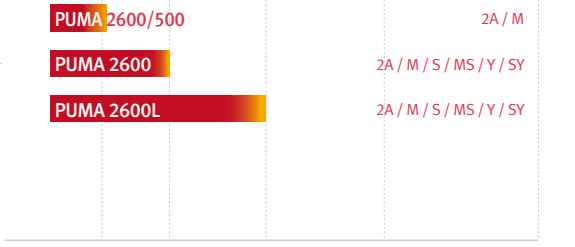

## Previous Model



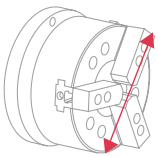
ø 255 mm
(10")



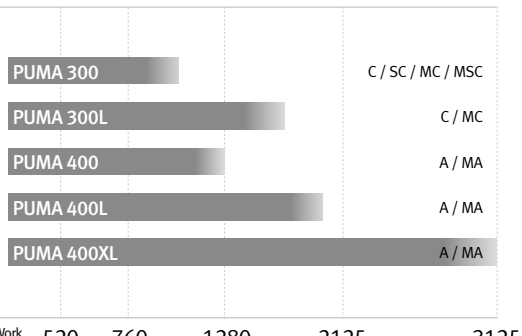

## PUMA 2100 / 2600 / 3100 series



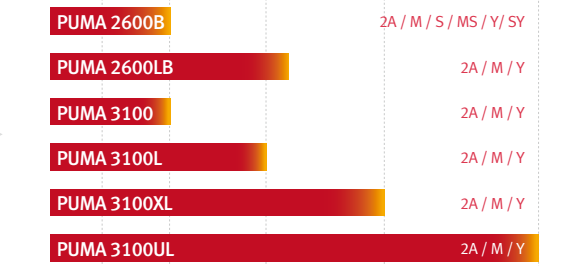

## Previous Model



ø 305 mm
(12")




## PUMA 2100 / 2600 / 3100 series



Turn-milling M

Sub spindle S

Y-axis Y

## PUMA 2100

Turning: std. L S LS

Turn-milling: M LM MS LMS Y LY SY LSY

| | | | |
|---|---|---|---|
| Max. work length | | mm (inch) | 520 / 760 [L] (20.5 / 29.9 [L]) |
| Chuck [Main / Sub] | | mm (inch) | 210 / 175 (8 / 6) |
| Max. turning dia. | | mm (inch) | 480, 406[1] {376[2]} (18.9,16.0[1] {14.8[2]}) |
| Travel | X-axis | mm (inch) | 260 (10.2) |
| | Z-axis | mm (inch) | 590 / 830 [L] (23.2 / 32.7 [L]) |
| | Y-axis | mm (inch) | 105 ‹±52.5› (4.1‹±2.1›) |

{ } : Option

## PUMA 2600*

Turning: std. L S LS /500 B LB SB LSB

Turn-milling: M LM MS LMS M/500 MB LMB MSB LMSB Y LY SY LSY YB LYB SYB LSYB

| | | | |
|---|---|---|---|
| Max. work length | | mm (inch) | 520 (500 machine) / 760 / 1280 [L] (20.5 / 29.9 / 50.4 [L]) |
| Chuck [Main / Sub] | | mm (inch) | 255 / 175 (10 / 6) |
| Max. turning dia. | | mm (inch) | 480, 376[2] (18.9, 14.8[2]) |
| Travel | X-axis | mm (inch) | 260 (10.2) |
| | Z-axis | mm (inch) | 590 (500 machine) / 830 / 1350 [L] (23.2 / 32.7 / 53.1 [L]) |
| | Y-axis | mm (inch) | 105 ‹±52.5› (4.1‹±2.1›) |

* : PUMA 2600B Chuck size: 305 mm (12.0 inch)

{ } : Option

## PUMA 3100

Turning: std. L XL UL

Turn-milling: M LM XLM ULM Y LY XLY ULY

| | | | |
|---|---|---|---|
| Max. work length | | mm (inch) | 760 / 1280 [L] (29.9 / 50.4 [L])<br>2125 [XL] / 3125 [UL]<br>(83.7 [XL] / 123.0 [UL]) |
| Chuck [Main] | | mm (inch) | 305 (12) |
| Max. turning dia. | | mm (inch) | 525, 420[3] (20.7, 16.5[3]) |
| Travel | X-axis | mm (inch) | 293 (10.2) |
| | Z-axis | mm (inch) | 830 / 1350 [L] / 2190 [XL] / 3190 [UL]<br>(32.7 / 53.1 [L] / 86.2 [XL] / 125.6 [UL]) |
| | Y-axis | mm (inch) | 130 ‹±65› (5.1 ‹±2.6›) |

{ } : Option

1) : PUMA 2100M [LM] / MS [LMS] / Y [LY] / SY [LSY]
2) : PUMA 2100, 2600M [LM] / MS [LMS] / Y [LY] / SY [LSY]
3) : PUMA 3100M/LM/XLM/ULM/Y/LY/XLY/ULY

# Machining range

We have added a high-rigidity bed and special functions and equipment for machining long workpieces.
It is the definitive bar workmachine, eliminating all compromise.

PUMA 3100ULY

| Model | A (Max. turning length) | B (Max. turning diameter) | C (Door open space) |
|---|---|---|---|
| PUMA 2100 / S | 520 (20.5) | 480 (18.9) | 695 (27.4) |
| PUMA 2100M / MS / Y / SY | | 406 (16.0) | |
| PUMA 2100L / LS | 760 (29.9) | 480 (18.9) | 815 (32.1) |
| PUMA 2100LM / LMS / LY / LSY | | 406 (16.0) | |
| PUMA 2600 / S | 760 (29.9) | 480 (18.9) | 815 (32.1) |
| PUMA 2600M / MS / Y / SY | | 376 (14.8) | |
| PUMA 2600L / LS | 1280 (50.4) | 480 (18.9) | 1375 (54.1) |
| PUMA 2600LM / LMS / LY / LSY | | 376 (14.8) | |
| PUMA 2600/500 | 520 (20.5) | 480 (18.9) | 695 (27.4) |
| PUMA 2600M/500 | | 376 (14.8) | |
| PUMA 2600B/LB | 725 / 1245 (28.5 / 49.0) | 480 (18.9) | 815 (32.1) |
| PUMA 2600MB/LMB | | 376 (14.8) | |
| PUMA 2600SB/MSB | 725 (28.5) | 480 / 376 (18.9 / 14.8) | 815 (32.1) |
| PUMA 2600YB/SYB | | 376 (14.8) | |
| PUMA 3100 | 760 (29.9) | 525 (20.7) | 850 (33.5) |
| PUMA 3100M / Y | | 420 (16.5) | |
| PUMA 3100L | 1280 (50.4) | 525 (20.7) | 1440 (56.7) |
| PUMA 3100LM / LY | | 420 (16.5) | |
| PUMA 3100XL | 2125 (83.7) | 525 (20.7) | 2260 (89.0) |
| PUMA 3100XLM / XLY | | 420 (16.5) | |
| PUMA 3100UL | 3125 (123.0) | 525 (20.7) | 3260 (128.3) |
| PUMA 3100ULM / ULY | | 420 (16.5) | |

Unit : mm (inch)

# Main spindle

To achieve a high level of stability during machining, improvements in rigidity have been the main focus in the design process. The mounting areas of main and Sub-spindles have been significantly widened and the spindle length shortened to minimise vibration. Spindle bearing diameter has been increased to improve rigidity. This also allows a larger through bore size for the sub-spindle. Spindles are available as belt type or built-in motor type.

## Bar work capacity

| | |
|---|---|
| PUMA 2100 | ø65 mm (ø2.6 inch) |
| PUMA 2600 | ø76 mm (ø3.0 inch) |
| PUMA 2600B<br>PUMA 3100 | ø102 mm (ø4.0 inch) |

## Power & torque of spindle

| Model | Speed (r/min) | Power [kW (Hp)] | Max. Torque [N·m (ft-lbs)] |
|---|---|---|---|
| PUMA 2100 | 4500 | std. 18.5 (24.8) | 183 (135.1) |
| | 5000 [Built-in] | opt. 22 (29.5) | 358 (264.2) |
| PUMA 2600 | 3500 | std. 22 (29.5) | 240 (177.1) |
| | 4000 [Built-in] | opt. 22 (29.5) | 599 (442.1) |
| PUMA 2600B | 2800 | std. 22 (29.5) | 1123 (828.8) |
| PUMA 3100 | 2800 | std. 22 (29.5) | 1123 (828.8) |
| | 3000 [Built-in] | opt. 30 (40.2) | 1203 (887.8) |

PUMA 2100 / 2600 / 3100 std.
2-axis / M / B / S/ MS spindle type

Built-in Motor Spindle Type
( opt. Y / SY models)

# Sub-spindle S MS SY

To make rotary tooling more effective, precise circular positioning of the spindle is necessary. The sub-spindle has 0.001° full C-axis contour function which is same with the function of main spindle. Moreover, power and torque are increased for more cutting capability.

## Power & torque of spindle

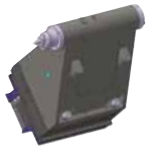
| Model | Speed (r/min) | Power [kW (Hp)] | Max. Torque [N·m (ft-lbs)] |
|---|---|---|---|
| PUMA 2100<br>PUMA 2600 | 4500 | std. 7.5 (10.1) | 85 (61.3) |
| | 6000 [Built-in] | opt. 15 (20.1) | 134 (98.9) |

## Enhanced sub-spindle

| Model | Previous Model | PUMA 2100 / 2600 |
|---|---|---|
| Chuck size | 135 / 170 mm (5 / 6 inch) | ▶ 175 mm (6 inch) |
| Spindle bearing diameter | 75 / 90 mm (3.0 / 3.5 inch) | ▶ 90 mm (3.5 inch) |
| Bar capacity | 43 / 53 mm (1.7 / 2.1 inch) | ▶ 48 mm (1.9 inch) |

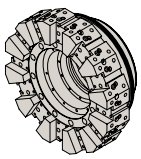
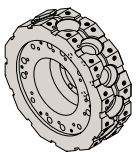
## Tailstock configuration 2A M Y

3 types of tail stocks such as manual, programmable and servo driven can be offered to customers as alternative choices.

| Model | | | PUMA 2100 / L series | PUMA 2600 / L series<br>PUMA 3100 / L series | PUMA 3100XL / UL series |
|---|---|---|---|---|---|
| Manual type | | Live center MT4 | std. | Not avaliable | Not avaliable |
| | | Built-in center MT3 | opt. | | |
| | | Live center MT5 | Not avaliable | std. | |
| | | Built-in center MT4 | | opt. | |
| Programmable type |  | Live center MT4 | opt. | Not avaliable | |
| | | Built-in center MT3 | | | |
| | | Live center MT5 | Not avaliable | opt. | |
| | | Built-in center MT4 | | | |
| | | Built-in center MT5 | | Not avaliable | std. |
| Servo driven type | | Live center MT4 | opt. | | Not avaliable |
| | | Built-in center MT3 | | | |
| | | Live center MT5 | Not avaliable | opt. | |
| | | Built-in center MT4 | | | |

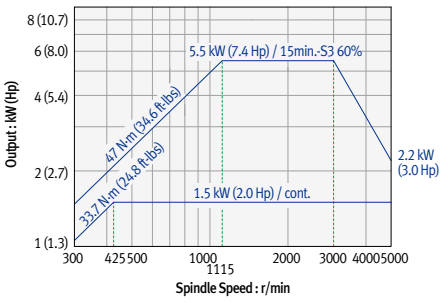
## Turret Turn 2A S Turn-milling M MS Y SY

The turret has been designed based on a modular concept. It provides improved tool clearance and optimum rigidity. The milling turret version includes 24 position indexing to increase the available tool capacity.

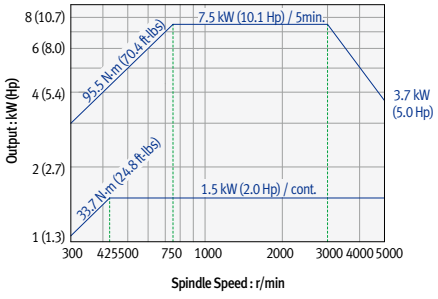
| | | Turning<br>PUMA 2100 / 2600 / 3100 | Turn-Milling<br>PUMA 2100 / 2600 / 3100 |
|---|---|---|---|
| No. of tool stations | |  <br>12 / 12 / 10 st |  <br>12 st {24*st opt.} |
| Tooling system | | Doosan Base | BMT55P / 65P / 65P<br>BMT65P opt. |
| Tool size | OD | 25 x 25 mm (1.0 x 1.0 inch) | |
| | ID | ø50 mm<br>(ø2.0 inch) | ø40 / 50 / 50 mm<br>(ø1.5 / 2.0 / 2.0 inch) |
| Curvic coupling | | ø230 mm (9.1 inch) | |
| Turret index time | | 0.15 s | |

* : PUMA 2100 / 2600 only

### Rotary tool power torque diagram




motor power std.
**5.5 kW (7.4 Hp)**
Max. spindle speed
**5000 r/min**




motor power opt.
**7.5 kW (10.1 Hp)**
Max. spindle speed
**5000 r/min**

## Virtual Y-axis function Y SY

In the Y-axis plane, tools can move in a plus or minus direction perpendicular to the Z-axis and spindle center line. Viewed from the operator's perspective, this Y-axis motion is toward or away from the door of the machine while X-axis moves from floor to ceiling.
Y-axis enables various shape of cutting. Y-axis is realized virtually by the linear interpolation and synchronous movement of X1 and X2-axis that make it possible to lower machine height for stability.

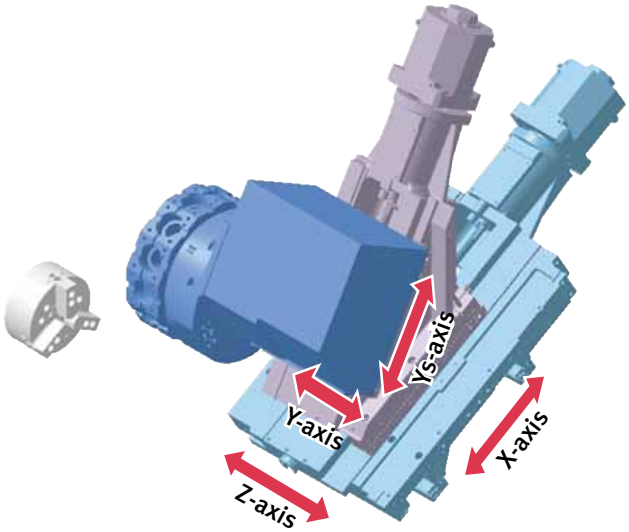
### Y-axis travel

PUMA 2100 / 2600 **105 mm**
[±52.5mm] (4.1 inch [±2.1 inch])

PUMA 3100 **130 mm**
[±65.0mm] (5.1 inch [±2.6 inch])

### Y-axis rapid

**10 m/min** (7.4 ipm)

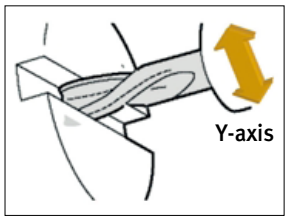



### Configuration of Y-axis

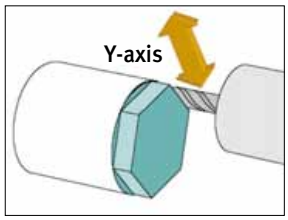
| Model | PUMA 2100/2600 | PUMA 3100 |
|---|---|---|
| Bed slant angle | 30° | 30° |
| X slant angle | 30° | 30° |
| X-Y slant angle | 30° | 30° |
| Y-axis travel | ±52.5 mm (±2.1 inch) | ±65.0 mm (±2.6 inch) |

### All enough in single setup

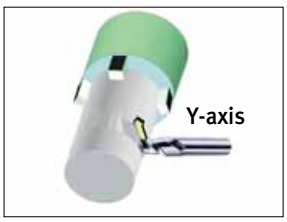
Simultaneous XYZ motion provides the capability milling complex shapes. In addition, the rigidly clamped C-axis disc brake enables heavy duty and precision machining.



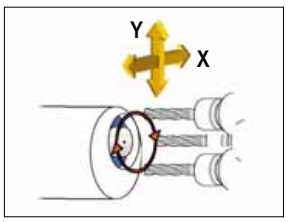
On-center face groove



Poly-side machine



Off-center side groove



Y&X-axis circular interpolation

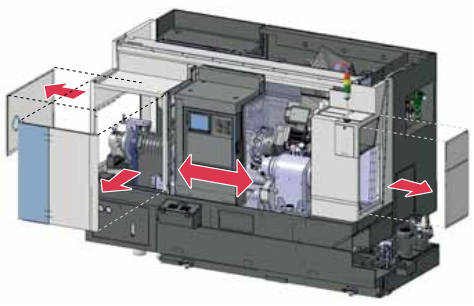
# Improved Maintainability

Maintainability is one of the crucial criteria that Doosan placed at the forefront of machine development. Large openings in the machine paneling facilitate access to the underlying maintenance units like lubricant oil tank and pneumatic fittings.

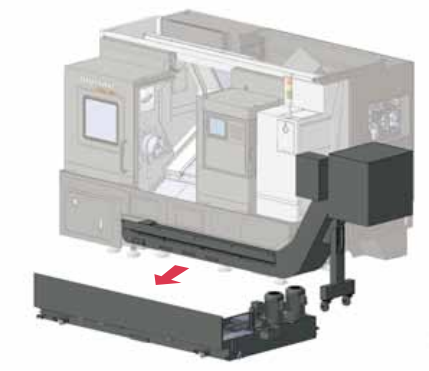
PUMA 2100/2600/3100 series

## Easy to Access for Maintenance

By new machine cover design concept, maintenance locations are easily seen, and wider openings allow easier access.

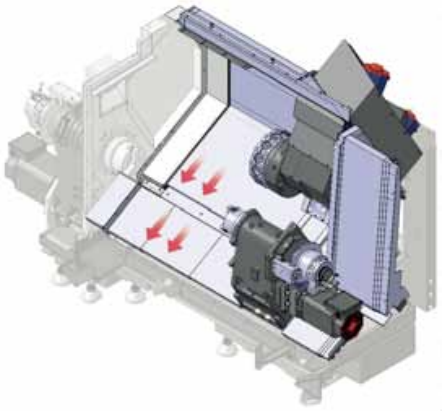


The coolant tank can be pulled out at the front and does not require the chip conveyor to be removed.



## Fully Wrapped Machine

To minimize the thermal effect on the machine, heat of chips should be prevented from being transmitted to bed and guide ways. Guide ways are fully covered so that heat can be isolated. Also, telescopic covers have strengthened linkage system that ensures durability. (only PUMA 2100/2600)



# Power Saving Function

## Automatic machine light turns off

This is smart function that can turn off the machine light automatically when no user touches key board of operation panel during specified time.

## Automatic machine sleep

If CNC operator's panel has not been used for a time, the motors for spindle, servo axis, coolant pump and chip conveyor etc. are powered off automatically. It is effective to reduce standby power. Save up stand by power from 10 to 14%.

# EZ Function

This function is to support simple setting of Tool Setter and improve the function to set tail stock position automatically with recorded tail stock position.

## EZ automatic tail stock function

This function enables the position setting of tail stock automatically. In programmable tail stock, the Z-axis position of tail stock is recorded automatically as the clamped position of tail stock. When tail stock needs to move to the other position, Z-axis moves to the pre-recorded position of Z-axis and tail stock unclamps by the button operation of OP pane.

## EZ tool setter function

This is specially designed for improving the efficiency of CNC turning center. If a user selects target tool to be checked by Tool Setter in manual mode, its moving axis is advanced forward to make the setter easy to touch off the tools, and the axis moves backward after touching the tool automatically.

# Easy Operation Package

These DOOSAN software packages have been customized to provide user-friendly functions.

## Programming

### G Code list

Operator can check the meaning of each G-code.

### M Code list

Operator can check the meaning of each M-code.

### Calculator

Operator can calcute numerical formula in relation to arc and hole easily.

### Servo tailstock thrust setting

Thrust force control is simple to set up using the specially designed servo-driven tail stock thrust setting software.
- Input value directly
- Select one of the initially set values

## Operation / Maintenance

### Tool load monitor opt.

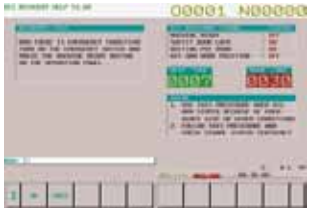
The main function of this software is to detect overload when a tool is wrong, and change it to an other tool. Stop machine to protect a tool holder and next tools by detecting overload caused by tool breakage or its wear. Use editable tool life management for spare tools. Monitor load meter for all spindles and axes. If the tool load reaches abnormal band recorded in “Set data”, the software issues an feed hold alarm or skips the tool.

### Operation rate - user log in

A major determinant of efficiency is the cost associated with setting up the equipment to make a particular product. This software can be used to manage machine operation rate of 3 operators. Total machine operation and real machining time for a month can be recorded and measured. It helps to evaluate and monitor each operational efficiency. To keep it secure, Password setting is essential.

### Back up custom data

This can be used to record tool load information detected in “Tool load monitor” for all tools used during cutting. By reloading recorded data in tool table, Tool Load Monitor software can compare the actual tool load with a recorded load pattern.



### Turret recovery help

The software is to help users recover turret step by step from trouble situation where it does not work. It can quickly recover your valuable machine.

## Easy Guide i

Operation Guidance, which supports entire operations on an all-in-one screen for daily machining including creating a program on the machine.

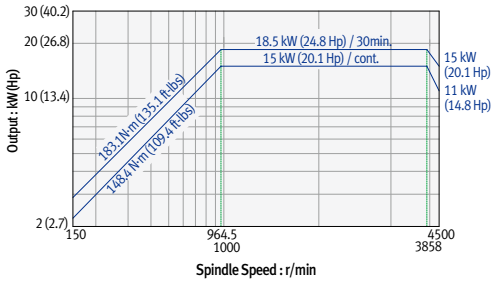
- **Uses one display screen to perform all operations including programming, checking by animation, and real machining.**
- **User-Friendly Operation :**
  Soft key selection of comprehensive cycle library
- **Easy programming**
  Based on ISO-code program format, complex machining motions can be created easily by this menu format.
- **Machine status window**
  Machine status such as actual position, feedrate and load meter are always displayed.
- **Realistic machining simulation**
  3-D solid model machining simulation is available.
- **Intuitive menu selecting**
  Menu can be selected easily and intuitively by soft-keys with icons.

Cycle machining menus for both of lathe machining and milling are available

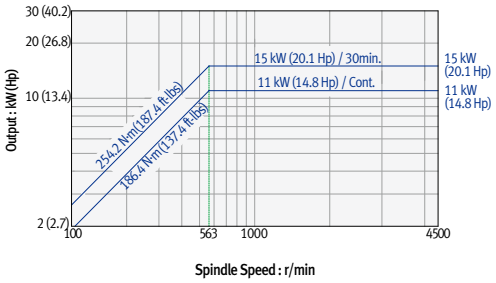
Programming time can be reduced

# Spindle Power - Torque Diagram

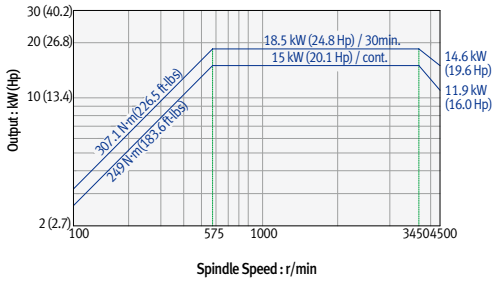
## Main spindle power - torque diagram PUMA 2100 series



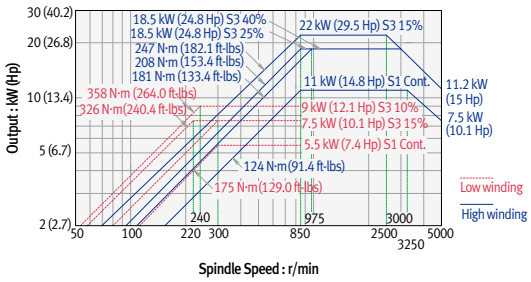

Belt Type std. | Spindle motor power **18.5 kW (24.8 Hp)** | Max. spindle speed **4500 r/min**




Belt Type opt. I | Spindle motor power **15 kW (20.1 Hp)** | Max. spindle speed **4500 r/min**



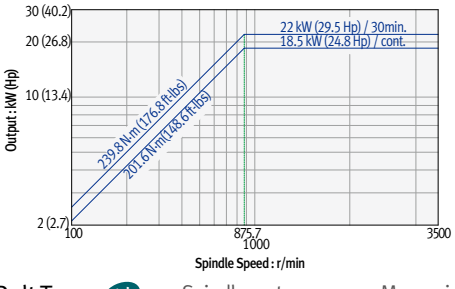

Belt Type opt. II | Spindle motor power **18.5 kW (24.8 Hp)** | Max. spindle speed **4500 r/min**



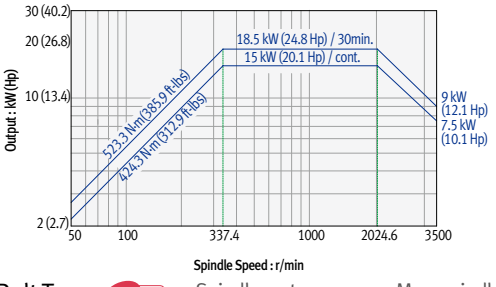

Built-in Type opt. I | Spindle motor power **22 kW (29.5 Hp)** | Max. spindle speed **5000 r/min**

* Only for Y-axis model

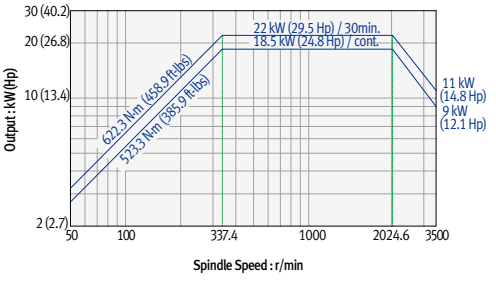
## Main spindle power - torque diagram PUMA 2600 series



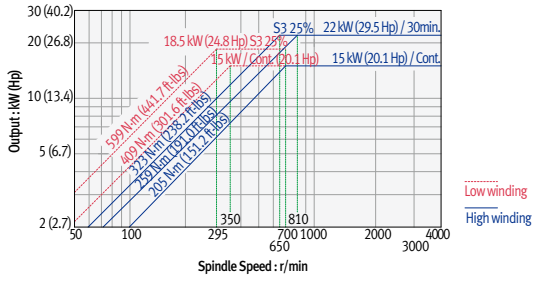

Belt Type std. | Spindle motor power **22 kW (29.5 Hp)** | Max. spindle speed **3500 r/min**




Belt Type opt. I | Spindle motor power **18.5 kW (24.8 Hp)** | Max. spindle speed **3500 r/min**




Belt Type opt. II | Spindle motor power **22 kW (29.5 Hp)** | Max. spindle speed **3500 r/min**

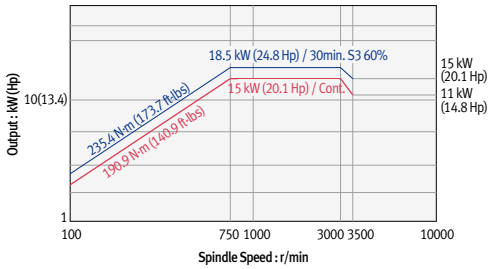



Built-in Type opt. I | Spindle motor power **22 kW (29.5 Hp)** | Max. spindle speed **4000 r/min**

* Only for Y-axis model

# Spindle Power - Torque Diagram

## Main spindle power - torque diagram PUMA 2600 / 500, PUMA 2600M / 500

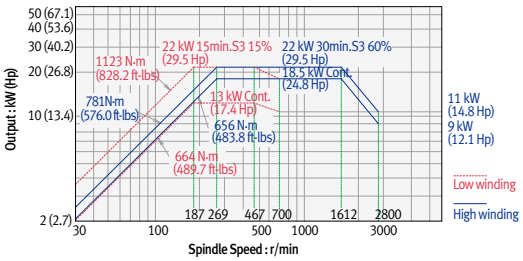



Belt Type std.

Spindle motor power
**18.5 kW ( Hp)**

Max. spindle speed
**3500 r/min**

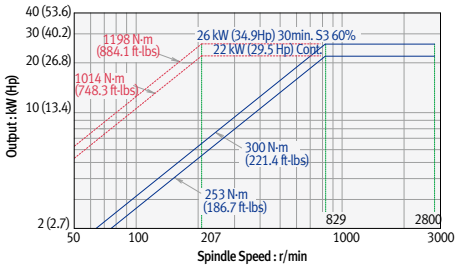
## Main spindle power - torque diagram PUMA 2600B / 3100 series




Belt Type std.

Spindle motor power
**22 kW (29.5 Hp)**

Max. spindle speed
**2800 r/min**



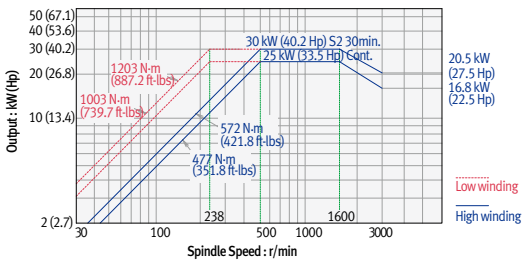

Belt Type with Gear Box opt.

Spindle motor power
**26 kW (34.9 Hp)**

Max. spindle speed
**2800 r/min**

※ PUMA 2600B/LB, PUMA 3100/L/XL/UL only

## Main spindle power - torque diagram PUMA 3100 series

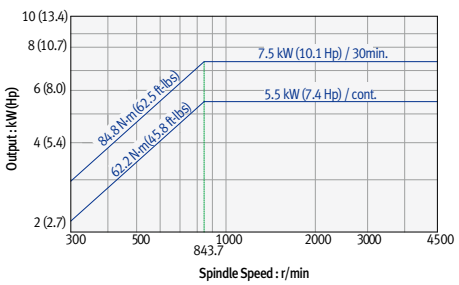



Built-in Type opt. I

Spindle motor power
**30 kW (40.2 Hp)**

Max. spindle speed
**3000 r/min**

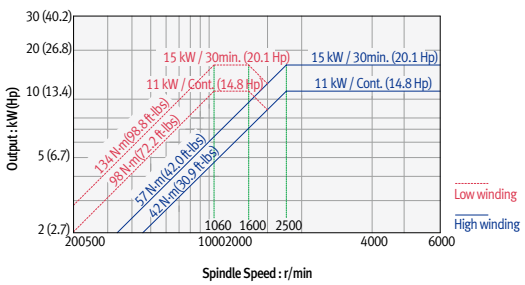
## Sub spindle power - torque diagram PUMA 2100 / 2600




Belt Type std.

Spindle motor power
**7.5 kW (10.1 Hp)**

Max. spindle speed
**4500 r/min**




Built-in Type opt.

Spindle motor power
**15 kW (20.1 Hp)**

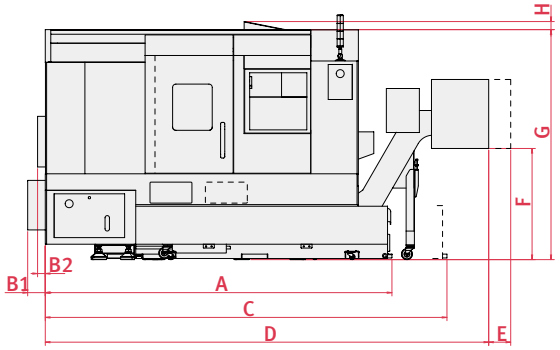
Max. spindle speed
**6000 r/min**

# External Dimensions

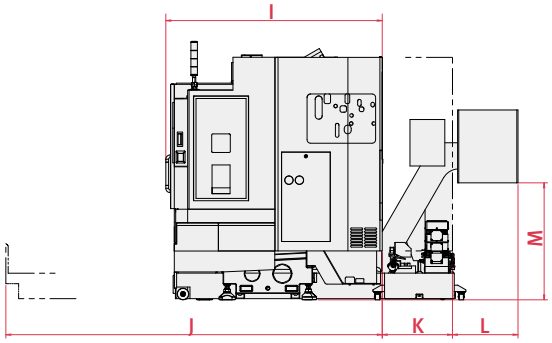
## PUMA 2100

Unit : mm (inch)

Front view




Side view



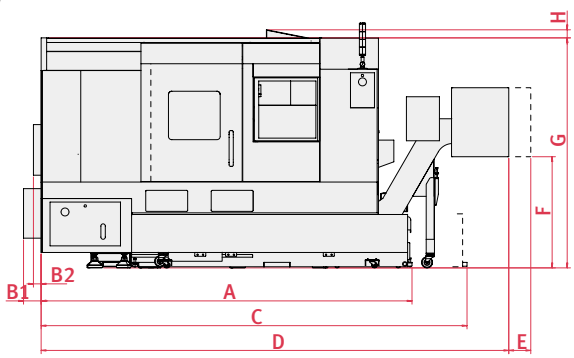

| Model | A | B1 | B2 | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PUMA 2100/S/M/MS | 3150 (124.0) | 160 (6.3) | - | 3650 (143.7) | 4030 (158.7) | 200 (7.9) | 1010 (39.8) | 1903 (74.9) | - | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |
| PUMA 2100Y/SY | 3150 (124.0) | 160 (6.3) | 25 (1.0) | 3650 (143.7) | 4030 (158.7) | 200 (7.9) | 1010 (39.8) | 2090 (82.3) | 73 (2.9) | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |
| PUMA 2100L/LS/LM/LMS | 3370 (132.7) | 160 (6.3) | - | 3870 (152.4) | 4250 (167.3) | 200 (7.9) | 1010 (39.8) | 1903 (74.9) | - | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |
| PUMA 2100LY/LSY | 3370 (132.7) | 160 (6.3) | 25 (1.0) | 3870 (152.4) | 4250 (167.3) | 200 (7.9) | 1010 (39.8) | 2090 (82.3) | 73 (2.9) | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |

B1 : Belt type. Standard Spindle Motor, Optional Spindle Motor is different.
B2 : Built-In type.

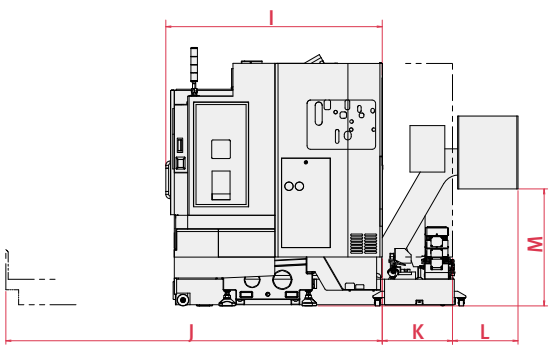
## PUMA 2600

Unit : mm (inch)

Front view




Side view




| Model | A | B1 | B2 | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PUMA 2600/500<br>PUMA 2600M/500 | 3150 (124.0) | 220 (8.7) | - | 3650 (143.7) | 4030 (158.7) | 200 (7.9) | 1010 (39.8) | 1903 (74.9) | - | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |
| PUMA 2600/S/M/MS | 3370 (132.7) | 230 (9.1) | - | 3870 (152.4) | 4250 (167.3) | 200 (7.9) | 1010 (39.8) | 1903 (74.9) | - | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |
| PUMA 2600B/SB/MB/MSB | 3370 (132.7) | 333 (13.1) | - | 3870 (152.4) | 4250 (167.3) | 200 (7.9) | 1010 (39.8) | 1903 (74.9) | - | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |
| PUMA 2600Y/SY | 3370 (132.7) | 230 (9.1) | 135 (5.3) | 3870 (152.4) | 4250 (167.3) | 200 (7.9) | 1010 (39.8) | 2090 (82.3) | 73 (2.9) | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |
| PUMA 2600YB/SYB | 3370 (132.7) | 333 (13.1) | - | 3870 (152.4) | 4250 (167.3) | 200 (7.9) | 1010 (39.8) | 2090 (82.3) | 73 (2.9) | 1863 (73.3) | 3240 (127.6) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |

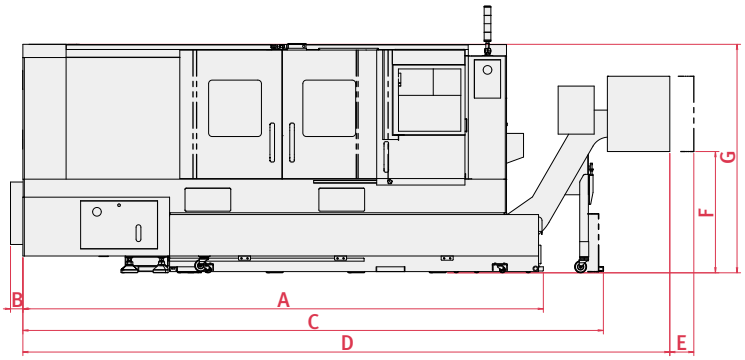
B1 : Belt type. Standard Spindle Motor, Optional Spindle Motor is different.
B2 : Built-In type.

# External Dimensions

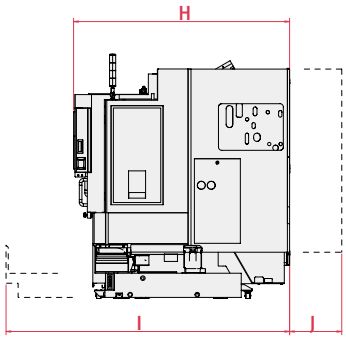
## PUMA 2600L

Unit : mm (inch)

Front view




Side view

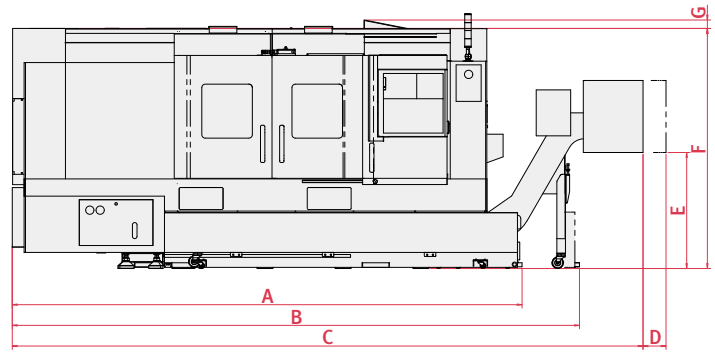



| Model | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| PUMA 2600L/LS/LM/LMS | 4335 (170.7) | - | 4835 (190.4) | 5389 (212.2) | 200 (7.9) | 1010 (39.8) | 1903 (74.9) | 1965 (77.4) | 3240 (127.6) | 523 (20.6) |
| PUMA 2600LB/LSB/LMSB | 4335 (170.7) | 103 (4.1) | 4835 (190.4) | 5389 (212.2) | 200 (7.9) | 1010 (39.8) | 1903 (74.9) | 1965 (77.4) | 3240 (127.6) | 523 (20.6) |

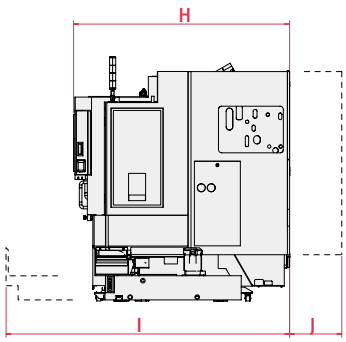
## PUMA 2600LY

Unit : mm (inch)

Front view




Side view



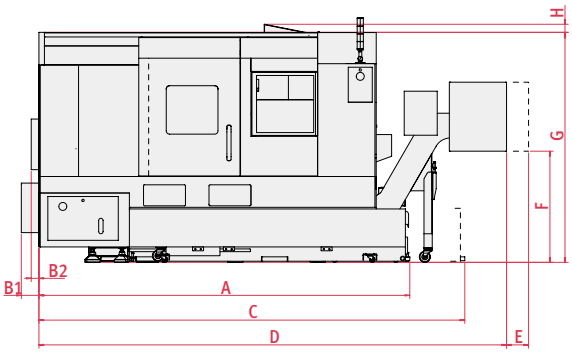

| Model | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| PUMA 2600LY/LSY/LYB/LSYB | 4435 (174.6) | 4935 (194.3) | 5489 (216.1) | 200 (7.9) | 1010 (39.8) | 2090 (82.3) | 73 (2.9) | 1965 (77.4) | 3240 (127.6) | 523 (20.6) |

# External Dimensions

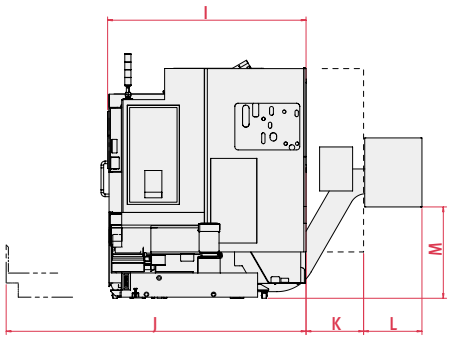
## PUMA 3100

Unit : mm (inch)

Front view




Side view



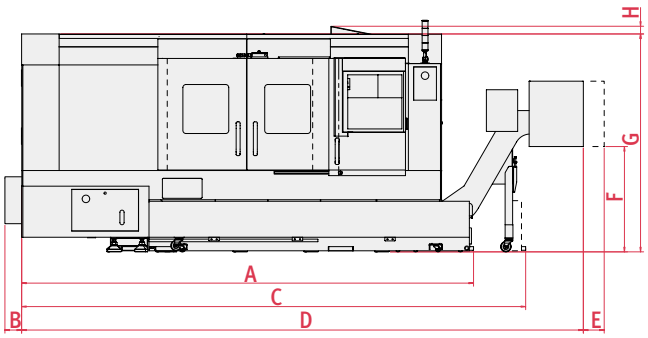

| Model | A | B1 | B2 | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PUMA 3100/M | 3575 (140.7) | 332 (13.1) | 250 (9.8) | 4095 (161.2) | 4486 (176.6) | 200 (7.9) | 1010 (39.8) | 1997 (78.6) | 20 (0.8) | 2003 (78.9) | 3410 (134.3) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |
| PUMA 3100Y | 3575 (140.7) | 332 (13.1) | 250 (9.8) | 4095 (161.2) | 4486 (176.6) | 200 (7.9) | 1010 (39.8) | 2214 (87.2) | 105 (4.1) | 2003 (78.9) | 3410 (134.3) | 523 (20.6) | 646 (25.4) | 1007 (39.6) |

B1 : Belt type. Standard Spindle Motor, Optional Spindle Motor is different.
B2 : Built-In type.

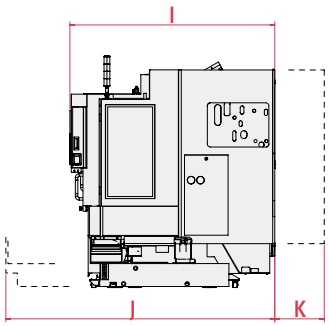
## PUMA 3100L

Unit : mm (inch)

Front view




Side view



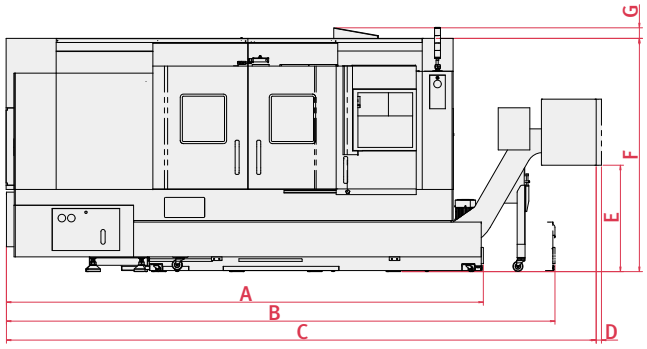

| Model | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PUMA 3100L/LM | 4455 (175.4) | 72 (2.8) | 5135 (202.2) | 5527 (217.6) | 50 (2.0) | 1010 (39.8) | 1997 (78.6) | 20 (0.8) | 2105 (82.9) | 3410 (134.3) | 523 (20.6) |

# External Dimensions

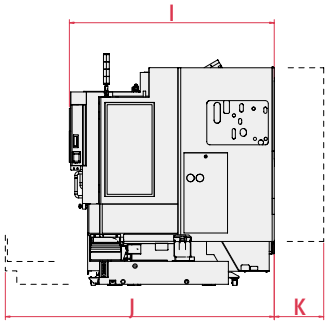
## PUMA 3100LY

Unit : mm (inch)

Front view




Side view

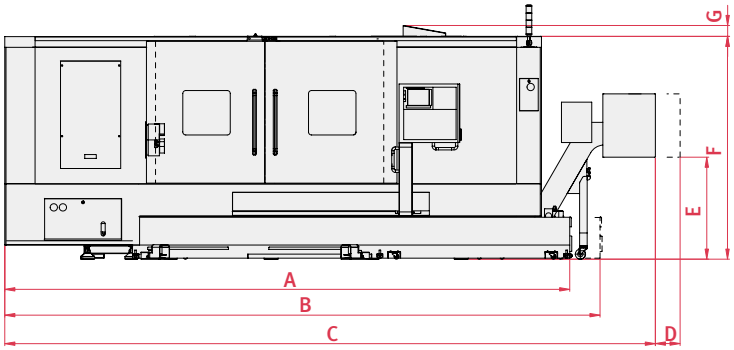



| Model | A | B | C | D | E | F | G | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|
| PUMA 3100LY | 4530 (178.4) | 5210 (205.2) | 5602 (220.6) | 50 (2.0) | 1010 (39.8) | 2214 (87.2) | 105 (4.1) | 2105 (82.9) | 3410 (134.3) | 523 (20.6) |

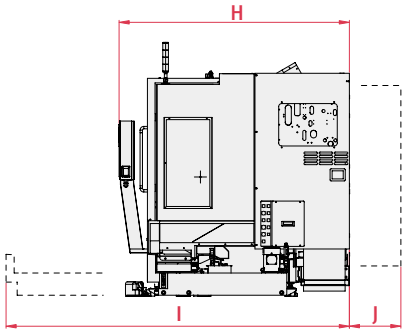
## PUMA 3100XL / UL

Unit : mm (inch)

Front view




Side view




| Model | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| PUMA 3100XL/XLM | 5615 (221.1) | 6015 (236.8) | 6443 (253.7) | 245 (9.6) | 1010 (39.8) | 2208 (86.9) | - | 2280 (89.8) | 3400 (133.9) | 523 (20.6) |
| PUMA 3100XLY | 5615 (221.1) | 6015 (236.8) | 6443 (253.7) | 245 (9.6) | 1010 (39.8) | 2208 (86.9) | 107 (4.2) | 2280 (89.8) | 3400 (133.9) | 523 (20.6) |
| PUMA 3100UL/ULM | 6585 (259.3) | 7265 (286.0) | 7670 (302.0) | 268 (10.6) | 1010 (39.8) | 2208 (86.9) | - | 2280 (89.8) | 3400 (133.9) | 523 (20.6) |
| PUMA 3100ULY | 6585 (259.3) | 7265 (286.0) | 7670 (302.0) | 268 (10.6) | 1010 (39.8) | 2208 (86.9) | 107 (4.2) | 2280 (89.8) | 3400 (133.9) | 523 (20.6) |

# Standard & Optional Features

● : standard features ○ :option △ : Pre-discussion is required X : Not available

| Option | PUMA 2100(L) / 2600(L) | | | | | | PUMA 3100 Std./L | | | PUMA 3100 XL/UL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2-axis Std. | M | S | MS | Y | SY | 2-axis Std. | M | Y | 2-axis Std. | M | Y |
| Special chucks | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ |
| Soft jaws | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Dual pressure chucking | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| Hydraulic chuck pressure switch | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Chuck clamp confirmation | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tail stock center : Live center | ● | ● | X | X | ● | X | ● | ● | ● | X | X | X |
| Tail stock center : Dead center | ○ | ○ | X | X | ○ | X | ○ | ○ | ○ | ● | ● | ● |
| Tail stock : Manual | ● | ● | X | X | ● | X | ● | ● | ● | X | X | X |
| Tail stock : Programmable | ○ | ○ | X | X | ○ | X | ○ | ○ | ○ | ● | ● | ● |
| Tail stock : Servo driven | ○ | ○ | X | X | ○ | X | ○ | ○ | ○ | X | X | X |
| Automatic quill advance & retract | ○ | ○ | X | X | ○ | X | ○ | ○ | ○ | ○ | ○ | ○ |
| Rotary tool holder | X | ● | X | ● | ● | ● | X | ● | ● | X | ● | ● |
| Tool setter : Manual | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tool setter : Automatic_electric | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Auto workpiece measurement | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Linear scale (X-axis) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Linear scale (Z-axis) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Linear scale (Y-axis) | X | X | X | X | ○ | ○ | X | X | ○ | X | X | ○ |
| Feedback system : Absolute position encoder | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Bar feeder interface | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Bar puller | △ | △ | △ | △ | △ | △ | △ | △ | △ | X | X | X |
| Workpiece ejector | X | X | ○ | ○ | X | ○ | X | X | X | X | X | X |
| Parts catcher with box | ○ | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | X | X | X |
| Parts catcher with conveyor | ○ | ○ | ○ | ○ | ○ | ○ | △ | △ | △ | X | X | X |
| Workpiece cut off confirmation | X | X | ○ | ○ | X | ○ | X | X | X | X | X | X |
| Automatic front door : with safety device | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Chip conveyor type : Right side | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Chip conveyor type : Rear side *1 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | X | X |
| Chip bucket | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| TSC for main / left spindle | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Oil skimmer | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Coolant level switch | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Coolant chiller | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Oil mist collector | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Coolant blower | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Air blower | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Air gun | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Signal tower (yellow, red, green) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Gantry loader | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ |
| V-stand for shaft workpiece | ○ | ○ | X | X | ○ | X | ○ | ○ | ○ | X | X | X |

*1 : PUMA 2100/L, PUMA 2600, PUMA 3100 only

## PUMA 3100XL / UL

○ : option X : Not available

| Steady Rest | | PUMA 2100 | | PUMA 2600 | | PUMA 3100 | |
|---|---|---|---|---|---|---|---|
| | | Std. | L | Std. | L | Std./L | XL/UL |
| Type | Hydraulic | ○ | ○ | ○ | ○ | ○ | ○ |
| | Programmable | ○ | ○ | ○ | ○ | ○ | ○ |
| | Servo driven*1 | X | X | X | X | X | ○ |
| Size | SLU-1 | ○ | ○ | ○ | ○ | X | X |
| | SLU-2 | ○ | ○ | ○ | ○ | ○ | ○ |
| | SLU-B3.1 | X | ○ | ○ | ○ | X | X |
| | SLU-3.1 | X | X | X | X | ○ | ○ |
| | SLU-3.2 | X | X | X | X | X | ○ |
| | SLU-4 | X | X | X | X | X | ○ *2 |
| | SLU-B4 | X | X | X | X | X | ○ |

*1 : Rack & Pinion type. *2 : SLU-4 is not available in servo driven type.

## High pressure coolant

| Model | | PUMA 2100 / 2600 / 3100 | |
|---|---|---|---|
| | | 60Hz | 50Hz |
| Standard | 1.5 bar | 0.4 kW x 0.15 MPa x 40 L/min (0.5 Hp x 21.8 psi x 10.6 galon/min) | 0.4 kW x 0.15 MPa x 40 L/min (0.5 Hp x 21.8 psi x 10.6 galon/min) |
| option | 5 bar | 0.9 kW x 0.45 MPa x 30 L/min (1.2 Hp x 65.3 psi x 7.9 galon/min) | 0.9 kW x 0.30 MPa x 30 L/min (1.2 Hp x 43.5 psi x 7.9 galon/min) |
| | 7 bar | 1.5 kW x 0.7 MPa x 30 L/min (2.0 Hp x 101.5 psi x 7.9 galon/min) | 1.5 kW x 0.5 MPa x 30 L/min (2.0 Hp x 72.5 psi x 7.9 galon/min) |
| | 10 bar* | 2.2 kW x 1.0 MPa x 30 L/min (3.0 Hp x 145.0 psi x 7.9 galon/min) | 2.2 kW x 0.7 MPa x 30 L/min (3.0 Hp x 101.5 psi x 7.9 galon/min) |
| | 15 bar* | 3.7 kW x 1.45 MPa x 30 L/min (5.0 Hp x 210.3 psi x 7.9 galon/min) | 4.0 kW x 2.8 MPa x 20 L/min (5.0 Hp x 145.0 psi x 7.9 galon/min) |
| Special option | 28 bar* | 4.0 kW x 2.8 MPa x 20 L/min (5.4 Hp x 406.6 psi x 5.3 galon/min) | 4.0 kW x 1.95 MPa x 20 L/min (5.0 Hp x 282.8 psi x 5.3 galon/min) |
| | 70 bar* | 5.5 kW x 7.0 MPa x 30 L/min (7.4 Hp x 1015.0 psi x 7.9 galon/min) | 5.5 kW x 7.0 MPa x 26 L/min (7.4 Hp x 1015.0 psi x 6.9 galon/min) |

* Recommend using coolant chiller

# Machine Specifications PUMA 2100 series

| Description | | | Unit | PUMA 2100/L | PUMA 2100M/LM | PUMA 2100MS/LMS | PUMA 2100S/LS |
|---|---|---|---|---|---|---|---|
| Capacity | Swing over bed | | mm (inch) | 780 (30.7) | | | |
| | Swing over front door | | mm (inch) | 680 (26.8) | | | |
| | Swing over saddle | | mm (inch) | 630 (24.8) | | | |
| | Recom. Turning diameter | | mm (inch) | 210 (8.3) | | | |
| | Max. turning diameter | | mm (inch) | 480 (18.9) | 406 (16.0) | | 480 (18.9) |
| | Max. turning length | | mm (inch) | 520 / 760 (20.5 / 29.9) | | | |
| | Bar working diameter | | mm (inch) | 65 (2.6) | | | |
| Travels | Travel distance | X-axis | mm (inch) | 260 [20+240] (10.2 [0.8+9.4]) | 260 [57+203] (10.2 [2.2+8.0]) | | 260 [20+240] (10.2 [0.8+9.4]) |
| | | Z-axis | mm (inch) | 590 / 830 (23.2 / 32.7) | | | |
| | | Y-axis | mm (inch) | - | | | |
| | | B-axis | mm (inch) | - | | 590 / 830 (23.2 / 32.7) | |
| Feedrates | Rapid traverse | X-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Z-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Y-axis | m/min (ipm) | - | | | |
| | | B-axis | m/min (ipm) | - | | 30 (1181.1) | |
| Main Spindle | Spindle speed (Belt Type) | | r/min | 4500 | | | |
| | Spindle speed (Built-in Type) | | r/min | - | | | |
| | Spindle nose | | | ASA A2#6 | | | |
| | Spindle bearing diameter (Front) | | mm (inch) | 120 (4.7) | | | |
| | Spindle through hole diameter | | mm (inch) | 76 (3.0) | | | |
| | Min. spindle indexing angle (C-axis) | | deg | - | 0.001 | | |
| Turret | No. of tool stations | | st | 12 | 12 [24] | | 12 |
| | OD tool size | | mm (inch) | 25 (1.0) | 25 [20] (1.0 [0.8]) | | 25 (1.0) |
| | Boring bar diameter | | mm (inch) | 50 (2.0) | 40 [32] (1.6 [1.3]) | | 50 (2.0) |
| | Indexing time (1st swivel time) | | s | 0.15 | | | |
| | Rotary tool spindle speed | | r/min | - | 5000 | | - |
| Tail stock | Quill diameter | | mm (inch) | 80 (3.1) | | - | |
| | Quill bore taper (Live) | | | MT#4 | | - | |
| | Compressed air supply | | mm (inch) | 80 (3.1) | | - | |
| Sub-spindle | Spindle speed (Belt [Built-in]) | | r/min | - | | 4500 [ - ] | |
| | Spindle nose | | | - | | ASA A2-5 | |
| | Spindle bearing diameter (Front) | | mm (inch) | - | | 90 (3.5) | |
| | Spindle through hole diameter | | mm (inch) | - | | 62 (2.4) | |
| | Min. spindle indexing angle (C-axis) | | deg | - | | 0.001 | |
| Motors | Main spindle motor | | kW (Hp) | 18.5 / 15 (24.8 / 20.1) | | | |
| | Sub spindle motor | | kW (Hp) | - | | 7.5 / 5.5 (10.1 / 7.4) | |
| | Rotary tool spindle motor | | kW (Hp) | - | | 5.5 (7.4) | - |
| | Coolant pump motor | | kW (Hp) | 0.4 (0.5) | | | |
| Power source | Electric power supply (Rated capacity) | | kVA | 35.63 | 38.41 | 45.63 | 42.85 |
| Machine size | Machine height | | mm (inch) | 1900 (74.8) | | | |
| | Machine dimension | length | mm (inch) | 3310 / 3530 (130.3 / 139.0) | | | |
| | | width | mm (inch) | 1863 (73.3) | | | |
| | Machine weight | | kg (lb) | 4850 / 5350 (10692.3 / 11794.6) | 5000 / 5500 (11023.0 / 12125.2) | 5450 / 5950 (12015.0 / 13117.3) | 5300 / 5800 (11684.3 / 12786.6) |

[ ] : Option

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan

# Machine Specifications PUMA 2100 /2600 series

| Description | | | Unit | PUMA 2100Y/LY | P 2100SY/LSY | PUMA 2600/L | PUMA 2600M/LM |
|---|---|---|---|---|---|---|---|
| Capacity | Swing over bed | | mm (inch) | 780 (30.7) | | | |
| | Swing over front door | | mm (inch) | 680 (26.8) | | | |
| | Swing over saddle | | mm (inch) | 630 (24.8) | | | |
| | Recom. Turning diameter | | mm (inch) | 210 (8.3) | | 255 (10.0) | |
| | Max. turning diameter | | mm (inch) | 406 (16.0) | | 480 (18.9) | 376 (14.8) |
| | Max. turning length | | mm (inch) | 520 / 760 (20.5 / 29.9) | | 760 / 1280 (29.9 / 50.4) | |
| | Bar working diameter | | mm (inch) | 65 (2.6) | | 76 (3.0) | |
| Travels | Travel distance | X-axis | mm (inch) | 260 [57+203] (10.2 [2.2+8.0]) | | 260 [20+240] (10.2 [0.8+9.4]) | 260 [72+188] (10.2 [2.8+7.4]) |
| | | Z-axis | mm (inch) | 590 / 830 (23.2 / 32.7) | | 830 / 1350 (32.7 / 53.1) | |
| | | Y-axis | mm (inch) | 105 [±52.5] (4.13 [±2.065]) | | - | |
| | | B-axis | mm (inch) | - | 590 / 830 (23.2 / 32.7) | - | |
| Feedrates | Rapid traverse | X-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Z-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Y-axis | m/min (ipm) | 10 (393.7) | | - | |
| | | B-axis | m/min (ipm) | - | 30 (1181.1) | - | |
| Main Spindle | Spindle speed (Belt Type) | | r/min | 4500 | | 3500 | |
| | Spindle speed(Built-in Type) | | r/min | 5000 | | - | |
| | Spindle nose | | | ASA A2#6 | | ASA A2#8 | |
| | Spindle bearing diameter (Front) | | mm (inch) | 120 (4.7) | | 140 (5.5) | |
| | Spindle through hole diameter | | mm (inch) | 76 (3.0) | | 86 (3.4) | |
| | Min. spindle indexing angle (C-axis) | | deg | 0.001 | | - | 0.001 |
| Turret | No. of tool stations | | st | 12 {24} | | 12 | 12 {24} |
| | OD tool size | | mm (inch) | 25 [20] (1.0 [0.8]) | | 25 (1.0) | 25 [20] (1.0 [0.8]) |
| | Boring bar diameter | | mm (inch) | 40 [32] (1.6 [1.3]) | | 50 (2.0) | 50 [40] (2.0 [1.6]) |
| | Indexing time (1st swivel time) | | s | 0.15 | | | |
| | Rotary tool spindle speed | | r/min | 5000 | | - | 5000 |
| Tail stock | Quill diameter | | mm (inch) | 80 (3.1) | - | 100 (3.9) | |
| | Quill bore taper (Live) | | | MT#4 | - | MT#5 | |
| | Quill travel | | mm (inch) | 80 (3.1) | - | 100 (3.9) | |
| Sub-spindle | Spindle speed (Belt [Built-in]) | | r/min | - | 4500 [6000] | - | |
| | Spindle nose | | | - | ASA A2-5 | - | |
| | Spindle bearing diameter (Front) | | mm (inch) | - | 90 (3.5) | - | |
| | Spindle through hole diameter | | mm (inch) | - | 62 (2.4) | - | |
| | Min. spindle indexing angle (C-axis) | | deg | - | 0.001 | - | |
| Motors | Main spindle motor | | kW (Hp) | 18.5 / 15 (24.8 / 20.1) | | 22 / 18.5 (29.5 / 24.8) | |
| | Sub spindle motor | | kW (Hp) | - | 7.5 / 5.5 (10.1 / 7.4) | - | |
| | Rotary tool spindle motor | | kW (Hp) | 5.5 (7.4) | | - | |
| | Coolant pump motor | | kW (Hp) | 0.4 (0.5) | | | |
| Power source | Electric power supply (Rated capacity) | | kVA | 41.32 | 48.54 | 40.72 | 43.5 |
| Machine size | Machine height | | mm (inch) | 2163 (85.2) | | 1900 (74.8) | |
| | Machine dimension | length | mm (inch) | 3310 / 3530 (130.3 / 139.0) | | 3600 / 4335 (141.7 / 170.7) | |
| | | width | mm (inch) | 1863 (73.3) | | 1863 / 1965 (73.3 / 77.4) | |
| | Machine weight | | kg (lb) | 5450 / 5950 (12015.0 / 13117.3) | 5900 / 6400 (13007.1 / 14109.4) | 5400 / 6700 (11904.8 / 14770.8) | 5550 / 6850 (12235.5 / 15101.4) |

[ ] : Option

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan

# Machine Specifications PUMA 2600 series

| Description | | | Unit | PUMA 2600MS/LMS | PUMA 2600S/LS | PUMA 2600Y/LY | PUMA 2600SY/LSY |
|---|---|---|---|---|---|---|---|
| Capacity | Swing over bed | | mm (inch) | 780 (30.7) | | | |
| | Swing over front door | | mm (inch) | 680 (26.8) | | | |
| | Swing over saddle | | mm (inch) | 630 (24.8) | | | |
| | Recom. Turning diameter | | mm (inch) | 255 (10.0) | | | |
| | Max. turning diameter | | mm (inch) | 376 (14.8) | 480 (18.9) | 376 (14.8) | |
| | Max. turning length | | mm (inch) | 760 / 1280 (29.9 / 50.4) | | | |
| | Bar working diameter | | mm (inch) | 76 (3.0) | | | |
| Travels | Travel distance | X-axis | mm (inch) | 260 [72+188] (10.2 [2.8+7.4]) | 260 [20+240] (10.2 [0.8+9.4]) | 260 [72+188] (10.2 [2.8+7.4]) | |
| | | Z-axis | mm (inch) | 830 / 1350 (32.7 / 53.1) | | | |
| | | Y-axis | mm (inch) | - | | 105 [±52.5] (4.13 [±2.065]) | |
| | | B-axis | mm (inch) | 830/1350 (32.7/53.1) | | - | 830/1350 (32.7/53.1) |
| Feedrates | Rapid traverse | X-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Z-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Y-axis | m/min (ipm) | - | | 10 (393.7) | |
| | | B-axis | m/min (ipm) | 30 (1181.1) | | - | 30 (1181.1) |
| Main Spindle | Spindle speed (Belt Type) | | r/min | 3500 | | | |
| | Spindle speed (Built-in) | | | - | | 4000 | |
| | Spindle nose | | | ASA A2#8 | | | |
| | Spindle bearing diameter (Front) | | mm (inch) | 140 (5.5) | | | |
| | Spindle through hole diameter | | mm (inch) | 86 (3.4) | | | |
| | Min. spindle indexing angle (C-axis) | | deg | 0.001 | - | 0.001 | |
| Turret | No. of tool stations | | st | 12 [24] | 12 | 12 [24] | |
| | OD tool size | | mm (inch) | 25 [20] (1.0 [0.8]) | 25 (1.0) | 25 [20] (1.0 [0.8]) | |
| | Boring bar diameter | | mm (inch) | 50 [40] (2.0 [1.6]) | 50 (2.0) | 50 [40] (2.0 [1.6]) | |
| | Indexing time (1st swivel time) | | s | 0.15 | | | |
| | Rotary tool spindle speed | | r/min | 5000 | - | 5000 | |
| Tail stock | Quill diameter | | mm (inch) | - | | 100 (3.9) | - |
| | Quill bore taper (Live) | | | - | | MT#5 | - |
| | Quill travel | | mm (inch) | - | | 100 (3.9) | - |
| Sub-spindle | Spindle speed (Belt [Built-in]) | | r/min | 4500 [ - ] | | - | 4500 [6000] |
| | Spindle nose | | | ASA A2-5 | | - | ASA A2-5 |
| | Spindle bearing diameter (Front) | | mm (inch) | 90 (3.5) | | - | 90 (3.5) |
| | Spindle through hole diameter | | mm (inch) | 62 (2.4) | | - | 62 (2.4) |
| | Min. spindle indexing angle (C-axis) | | deg | 0.001 | | - | 0.001 |
| Motors | Main spindle motor | | kW (Hp) | 22 / 18.5 (29.5 / 24.8) | | | |
| | Sub spindle motor | | kW (Hp) | 7.5 / 5.5 (10.1 / 7.4) | | - | 7.5 / 5.5 (10.1 / 7.4) |
| | Rotary tool spindle motor | | kW (Hp) | 5.5 [7.5] (7.4 [10.1]) | - | 5.5 [7.5] (7.4 [10.1]) | |
| | Coolant pump motor | | kW (Hp) | 0.4 (0.5) | | | |
| Power source | Electric power supply (Rated capacity) | | kVA | 51.65 | 48.86 | 46.4 | 54.55 |
| Machine size | Machine height | | mm (inch) | 1900 (74.8) | | 2163 (85.2) | |
| | Machine dimension | length | mm (inch) | 3600 / 4335 (141.7 / 170.7) | | 3600 / 4435 (141.7 / 174.6) | |
| | | width | mm (inch) | 1863 / 1965 (73.3 / 77.4) | | | |
| | Machine weight | | kg (lb) | 6000 / 7300 (13227.5 / 16093.5) | 5850 / 7150 (12896.9 / 15762.8) | 6000 / 7300 (13227.5 / 16093.5) | 6450 / 7750 (14219.6 / 17085.6) |

[ ] : Option

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan

# Machine Specifications PUMA 2600 series

| Description | | | Unit | PUMA 2600/500 | PUMA 2600M/500 | PUMA 2600B/LB | PUMA 2600MB/LMB |
|---|---|---|---|---|---|---|---|
| Capacity | Swing over bed | | mm (inch) | 780 (30.7) | | | |
| | Swing over front door | | mm (inch) | 680 (26.8) | | | |
| | Swing over saddle | | mm (inch) | 630 (24.8) | | | |
| | Recom. Turning diameter | | mm (inch) | 255 (10.0) | | 305 (12.0) | |
| | Max. turning diameter | | mm (inch) | 480 (18.9) | 376 (14.8) | 480 (18.9) | 376 (14.8) |
| | Max. turning length | | mm (inch) | 520 (20.5) | | 725 [1245] (28.5 [49.0]) | |
| | Bar working diameter | | mm (inch) | 65 (2.6) | | 102 (4.0) | |
| Travels | Travel distance | X-axis | mm (inch) | 260 [20+240] (10.2 [0.8+9.4]) | 260 [72+188] (10.2 [2.8+7.4]) | 260 [20+240] (10.2 [0.8+9.4]) | 260 [72+188] (10.2 [2.8+7.4]) |
| | | Z-axis | mm (inch) | 590 (23.2) | | 830[1350] (32.7[53.1]) | |
| | | Y-axis | mm (inch) | - | | | |
| | | B-axis | mm (inch) | - | | | |
| Feedrates | Rapid traverse | X-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Z-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Y-axis | m/min (ipm) | - | | | |
| | | B-axis | m/min (ipm) | - | | | |
| Main Spindle | Spindle speed (Belt Type) | | r/min | 3500 (137.8) | | 2800 (110.2) | |
| | Spindle nose | | | ASA A2-8 | | A2-11 | |
| | Spindle bearing diameter (Front) | | mm (inch) | 140 (5.5) | | 160 (6.3) | |
| | Spindle through hole diameter | | mm (inch) | 86 (3.4) | | 115 (4.5) | |
| | Min. spindle indexing angle (C-axis) | | deg | 0.001 | | | |
| Turret | No. of tool stations | | st | 12 | 12 [24] | 12 | 12 [24] |
| | OD tool size | | mm (inch) | 25 (1.0) | 25 [20] (1.0 [0.8]) | 25 (1.0) | 25 [20] (1.0 [0.8]) |
| | Boring bar diameter | | mm (inch) | 50 (2.0) | 50 [40] (2.0 [1.6]) | 50 (2.0) | 50 [40] (2.0 [1.6]) |
| | Indexing time (1st swivel time) | | s | 0.15 | | | |
| | Rotary tool spindle speed | | r/min | - | 5000 | - | 5000 |
| Tail stock | Quill diameter | | mm (inch) | 100 (3.9) | | | |
| | Quill bore taper (Live) | | | MT#5 | | | |
| | Quill travel | | mm (inch) | 100 (3.9) | | | |
| Sub-spindle | Spindle speed (Belt [Built-in]) | | r/min | - | | | |
| | Spindle nose | | | - | | | |
| | Spindle bearing diameter (Front) | | mm (inch) | - | | | |
| | Spindle through hole diameter | | mm (inch) | - | | | |
| | Min. spindle indexing angle (C-axis) | | deg | - | | | |
| Motors | Main spindle motor | | kW (Hp) | 18.5/15 (24.8/20.1) | | 22/18.5 (29.5/24.8) | |
| | Sub spindle motor | | kW (Hp) | - | | | |
| | Rotary tool spindle motor | | kW (Hp) | - | 5.5 (7.4) | - | 5.5 (7.4) |
| | Coolant pump motor | | kW (Hp) | 0.4 (0.5) | | | |
| Power source | Electric power supply (Rated capacity) | | kVA | 40.72 | 44.42 | 40.72 | 44.42 |
| Machine size | Machine height | | mm (inch) | 1900 (74.8) | | | |
| | Machine dimension | length | mm (inch) | 3370 (132.7) | | 3700 [4438] (145.7 [174.7]) | |
| | | width | mm (inch) | 1863 (73.3) | | | |
| | Machine weight | | kg (lb) | 4900 (10802.5) | 5000 (11023.0) | 5500 [6800] (12125.2 [14991.2]) | 5650 [6950] (12455.9 [15321.9]) |

[ ] : Option

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan

# Machine Specifications PUMA 2600 series

| Description | | | Unit | PUMA 2600SB | PUMA 2600MSB | PUMA 2600YB | PUMA 2600SYB |
|---|---|---|---|---|---|---|---|
| Capacity | Swing over bed | | mm (inch) | 780 (30.7) | | | |
| | Swing over front door | | mm (inch) | 680 (26.8) | | | |
| | Swing over saddle | | mm (inch) | 630 (24.8) | | | |
| | Recom. Turning diameter | | mm (inch) | 305 (12.0) | | | |
| | Max. turning diameter | | mm (inch) | 480 (18.9) | 376 (14.8) | | |
| | Max. turning length | | mm (inch) | 725 (28.5) | | | |
| | Bar working diameter | | mm (inch) | 102 (4.0) | | | |
| Travels | Travel Travel distance | X-axis | mm (inch) | 260 (10.2) | 20+240 (0.8+9.4) | 260 (10.2) | |
| | | Z-axis | mm (inch) | 830 (32.7) | | | |
| | | Y-axis | mm (inch) | - | | 105 (4.1) | |
| | | B-axis | mm (inch) | 830 (32.7) | | - | 830 (32.7) |
| Feedrates | Rapid traverse | X-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Z-axis | m/min (ipm) | 30 (1181.1) | | | |
| | | Y-axis | m/min (ipm) | - | | 10 (393.7) | |
| | | B-axis | m/min (ipm) | 30 (1181.1) | | - | 30 (1181.1) |
| Main Spindle | Spindle speed (Belt Type) | | r/min | 2800 (110.2) | | | |
| | Spindle nose | | | ASA A2-11 | | | |
| | Spindle bearing diameter (Front) | | mm (inch) | 160 (6.3) | | | |
| | Spindle through hole diameter | | mm (inch) | 115 (4.5) | | | |
| | Min. spindle indexing angle (C-axis) | | deg | - | 0.001 | | |
| Turret | No. of tool stations | | st | 12 | 12 [24] | | |
| | OD tool size | | mm (inch) | 25 (1.0) | 25 [20] (1.0 [0.8]) | | |
| | Boring bar diameter | | mm (inch) | 50 (2.0) | 50 [40] (2.0 [1.6]) | | |
| | Indexing time (1st swivel time) | | s | 0.15 | | | |
| | Rotary tool spindle speed | | r/min | - | 5000 | | |
| Tail stock | Quill diameter | | mm (inch) | 100 (3.9) | | | |
| | Quill bore taper (Live) | | | MT#5 | | | |
| | Quill travel | | mm (inch) | 100 (3.9) | | | |
| Sub-spindle | Spindle speed (Belt [Built-in]) | | r/min | 4500 (177.2) | | - | 4500 (177.2) |
| | Spindle nose | | | ASA A2#5 | | - | ASA A2#5 |
| | Spindle bearing diameter (Front) | | mm (inch) | 90 (3.5) | | - | 90 (3.5) |
| | Spindle through hole diameter | | mm (inch) | 62 (2.4) | | - | 62 (2.4) |
| | Min. spindle indexing angle (C-axis) | | deg | 0.001 | | - | 0.001 |
| Motors | Main spindle motor | | kW (Hp) | 22/18.5 (29.5/24.8) | | | |
| | Sub spindle motor | | kW (Hp) | 7.5/5.5 (10.1/7.4) | | - | 7.5/5.5 (10.1/7.4) |
| | Rotary tool spindle motor | | kW (Hp) | - | 5.5 (7.4) | | |
| | Coolant pump motor | | kW (Hp) | 0.4 (0.5) | | | |
| Power source | Electric power supply (Rated capacity) | | kVA | 48.86 | | 46.40 | 54.55 |
| Machine size | Machine height | | mm (inch) | 1900 (74.8) | | 2163 (85.2) | |
| | Machine dimension | length | mm (inch) | 3700 (145.7) | | | |
| | | width | mm (inch) | 1863 (73.3) | | | |
| | Machine weight | | kg (lb) | 5950 (13117.3) | 6100 (13448.0) | 6100 (13448.0) | 6550 (14440.1) |

[ ] : Option

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan

# Machine Specifications PUMA 3100 series

| | Description | | Unit | PUMA 3100/L/XL/UL | PUMA 3100M/LM/XLM/ULM | PUMA 3100Y/LY/XLY/ULY |
|---|---|---|---|---|---|---|
| Capacity | Swing over bed | | mm (inch) | 850 (33.5) | | |
| | Swing over front door | | mm (inch) | 720 (28.3)* / 850 (33.5)** | | |
| | Swing over saddle | | mm (inch) | 670 (26.4) | | |
| | Recom. Turning diameter | | mm (inch) | 305 (12.0) | | |
| | Max. turning diameter | | mm (inch) | 525 (20.7) | 420 (16.5) | |
| | Max. turning length | | mm (inch) | 760 / 1280 / 2125 / 3125 (29.9 / 50.4 / 83.7 / 123.0) | | |
| | Bar working diameter | | mm (inch) | 102 (4.0) | | |
| Travels | Travel distance | X-axis | mm (inch) | 293 [30.5+262.5] (11.5 [1.2+10.3]) | 293 [83+210] (11.5 [3.3+8.3]) | |
| | | Z-axis | mm (inch) | 830 / 1350 / 2190 / 3190(32.7 / 53.1 / 86.2 / 125.6) | | |
| | | Y-axis | mm (inch) | - | | 130 [±65] (5.1 [±2.6]) |
| | | B-axis | mm (inch) | - | | |
| Feedrates | Rapid traverse | X-axis | m/min (ipm) | 30 (1181.1) | | |
| | | Z-axis | m/min (ipm) | 30 / 30 / 30 / 26 (1181.1 / 1181.1 / 1181.1 / 1023.6) | | |
| | | Y-axis | m/min (ipm) | - | | 10 (393.7) |
| | | B-axis | m/min (ipm) | - | | |
| Main Spindle | Spindle speed (Belt Type) | | r/min | 2800 | | |
| | Spindle speed(Built-in Type) | | r/min | 3000 | | |
| | Spindle nose | | | ASA A2#11 | | |
| | Spindle bearing diameter (Front) | | mm (inch) | 160 (6.3) | | |
| | Spindle through hole diameter | | mm (inch) | 115 (4.5) | | |
| | Min. spindle indexing angle (C-axis) | | deg | 0.001 | | |
| Turret | No. of tool stations | | st | 10 | 12 | |
| | OD tool size | | mm (inch) | 25 (1.0) | | |
| | Boring bar diameter | | mm (inch) | 50 (2.0) | | |
| | Indexing time (1st swivel time) | | s | 0.15 | | |
| | Rotary tool spindle speed | | r/min | - | 5000 | |
| Tail stock | Quill diameter | | mm (inch) | 100 / 100 / 120 / 120 (3.9 / 3.9 / 4.7 / 4.7) | | |
| | Quill bore taper (Live) | | | MT#5 | | |
| | Quill travel | | mm (inch) | 100 / 100 / 120 / 120 (3.9 / 3.9 / 4.7 / 4.7) | | |
| Sub-spindle | Spindle speed (Belt [Built-in]) | | r/min | - | | |
| | Spindle nose | | | - | | |
| | Spindle bearing diameter (Front) | | mm (inch) | - | | |
| | Spindle through hole diameter | | mm (inch) | - | | |
| | Min. spindle indexing angle (C-axis) | | deg | - | | |
| Motors | Main spindle motor | | kW (Hp) | 22 / 18.5 (29.5 / 24.8) | | |
| | Sub spindle motor | | kW (Hp) | - | | |
| | Rotary tool spindle motor | | kW (Hp) | 5.5 [7.5] (7.4 [10.1]) | | |
| | Coolant pump motor | | kW (Hp) | 0.4 (0.5) | | |
| Power source | Electric power supply (Rated capacity) | | kVA | 41.64 / 41.64 / 42.83 / 42.83 | 44.42 / 44.42 / 45.61 / 45.61 | 46.40 / 46.40 / 47.59 / 47.59 |
| Machine size | Machine height | | mm (inch) | 2020 / 2020 / 2315 / 2315 (79.5 / 79.5 / 91.1 / 91.1) | | 2315 (91.1) |
| | Machine dimension | length | mm (inch) | 3910 / 4530 / 5615 / 5685 (153.9 / 178.3 / 221.1 / 223.8) | | |
| | | width | mm (inch) | 2002 / 2105 / 2280 / 2280 (78.8 / 82.9 / 89.8 / 89.8) | | |
| | Machine weight | | kg (lb) | 5850/ 7350 / 10150 / 11650 (12896.9 / 16203.7 / 22376.6 / 23683.5) | 6000 / 7500 / 10300 / 11800 (13227.5 / 16534.4/22707.3 / 26014.4) | 6500 / 8000 / 10800 / 12300 (14329.8 / 17636.7 / 23809.6 / 27116.5) |

* : PUMA 3100/M/L/LM/Y/LY ** : PUMA 3100XL/UL/XLM/ULM/XLY/ULY
[ ] : Option

## Standard feature

- Hydraulic power unit
- Lubrication equipment
- Coolant supply equipment
- Front guard door interlock
- Hydraulic chuck & actuating cylinder
- Soft jaws • Foot switch
- Standard tool kit (tool holder & boring sleeve)
- Work light • Manuals
- Levelling jack screw & plates
- Hand tool kit (including small tool for operations)
- Safety precaution name plates

## Optional feature

- Additional tool holder & sleeves
- Air blast for chuck jaw cleaning
- Air gun
- Automatic door with safety device
- Bar feeder interface
- Dual chucking pressure
- Hardened & ground jaws
- Pressure switch for chucking pressure check
- High pressure coolant
- Oil skimmer
- Chip conveyor
- Chip bucket
- Programmable tail stock
- Servo driven tail stock
- Signal tower (yellow, red, green)
- Tail stock quill for dead center
- Tool pre-setter (Automatic type)
- Tool pre-setter (Manual type)
- Work ejector
- Parts catcher
- Parts conveyor
- Controller : Fanuc 31i

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan

# NC Unit Specifications

## Fanuc 31i

| AXES CONTROL | |
|---|---|
| - Controlled path | 1 path [2 path] |
| - Controlled axes | X, Z, C, Y [C2, B] |
| - Simultaneous controlled axes | 4 axes |
| - Angular axis control | |
| - Axis control by PMC | |
| - Backlash compensation | 0 ~ ±9999 pulses |
| - Backlash compensation for each rapid traverse and cutting feed | |
| - Chamfering on / off | |
| - Cs contouring control | |
| - HRV2 control | |
| - Least input command | 0.001 / 0.0001 mm/inch |
| - Machine lock | All axis / each axis |
| - Mirror image | |
| - Overtravel | |
| - Position switch | |
| - Stored pitch error compensation | |
| - Stored stroke check 1 | |
| - Torque control | |
| - Interference chek for rotary area | |
| - Unexpected disturbance torque detection function | |

| OPERATION | |
|---|---|
| - Automatic operation (memory) | |
| - MDI operation | |
| - DNC Operation with Memory card | |
| - Buffer register | |
| - Dry run | |
| - Handle incremental feed | X1, X10, X100 |
| - Program restart | |
| - Wrong operation prevention | |
| - JOG feed | |
| - Manual handle feed | 1unit |
| - Manual intervention and return | |
| - Manual pulse generator | 1 ea |
| - Manual reference position return | |
| - Program number search | |
| - Refernce position setting without dog | |
| - Sequence number search | |
| - Single block | |

| INTERPOLATION FUNCTIONS | |
|---|---|
| - Nano interpolation | |
| - Positioning | G00 |
| - 1st. Reference position return | Manual, G28 |
| - 2nd. reference position return | G30 |
| - Circular interpolation | G02 |
| - Continuous threading | |
| - Cylindrical interpolation | |
| - Dwell (per sec) | G04 |
| - Linear interpolation | G01 |
| - Multiple threading | |
| - Polar coordinate interpolation | |
| - Helical interpolation | |
| - Reference position return check | G27 |
| - Skip | G31 |
| - Thread cutting / Synchronous cutting | |
| - Thread cutting retract | |
| - Torque limit skip | |

| FEED FUNCTION | |
|---|---|
| - Automatic acceleration / deceleration | |
| - Cutting feedrate clamp | |
| - Feed per minute | |
| - Feed per revolution | |
| - Feedrate override (10% unit) | 0 - 200 % |
| - Jog feed override (10% unit) | 0 - 2000 mm/min |
| - Manual per revolution feed | |
| - Override cancel | |
| - Rapid traverse override | F0, 25, 100 % |
| - Tangential speed constant control | |

| AUXILIARY / SPINDLE SPEED FUNCTION | |
|---|---|
| - Spindle orientation | |
| - Actual spindle speed output | |
| - Auxiliary function lock | |
| - Constant surface speed control | |
| - M-code function M3 digits | M3 digits |
| - Multi spindle control | |
| - Rigid tapping | |
| - S-code function | S4 / S5 digits |
| - Spindle serial output | S4 / S5 digits |
| - Spindle speed override | 0 - 150 % |
| - Spindle synchronous control | |
| - Spindle Output switching | |

| PROGRAM INPUT | |
|---|---|
| - Absolute / incremental programming | |
| - Addition of custom macro common variables | #100~#199, #500~#999 |
| - Automatic coordinate system setting | |
| - Canned cycle for drilling / Turning | |
| - Canned cycle | |
| - Circular interpolation by R programming | |
| - Control in/out | |
| - Coordinate system setting | G50 |
| - Coordinate system shift | |
| - Custom macro | |
| - Decimal point programming / Pocket calculator type decimal point programming | |
| - Diameter/radius programming | (X axis) |
| - Direct drawing dimension programming | |
| - Direct input of coordinate system shift | |
| - G code system A | |
| - G code system B/C | |
| - Input unit 10 time multiply | |
| - Label skip | |
| - Macro executor | |
| - Manual absolute on and off | |
| - Maximum program dimension | ±9 digit |
| - Multiple repetitive canned cycle | G70 - G76 |
| - Multiple repetitive canned cycle II | |
| - Optional block skip | 9 piece |
| - Parity check | |
| - Plane selection | G17, G18, G19 |
| - Program file name | 32 characters |
| - Program stop / end(M00, M01 / M02, M30) | |
| - Programmable data input | G10 |
| - Sequence number | N8 digit |
| - SUB program call | 10 folds nested |
| - Tape code : ISO / EIA auto recognition | EIA auto recognition |
| - Tape format for FANUC Series15 | |
| - Work coordinate system | G52 - G59 |

| TOOL FUNCTION / TOOL COMPENSATION | |
|---|---|
| - Automatic tool offset | |
| - Direct input of offset value measured | |
| - Direct input of offset value measured B | |
| - T-code function | T2+2 digits |
| - Tool geometry / wear compensation | |
| - Tool life management | |
| - Tool Load Monitoring system * | |
| - Tool nose radius compensation | |
| - Tool offset | G43, G44, G49 |
| - Tool offset pairs | ±6 digits : 32 pairs |
| - Tool offset value counter input | |
| - Y-axis offset | |

| EDITING OPERATION | |
|---|---|
| - Back ground editting | |
| - Extended part program editing | |
| - Memory card edit & operation | |
| - Number of registered programs | 500 ea |
| - Part program editing | |
| - Part program storage size | 640 (256 Kbyte) m |
| - Program protect | |

| SETTING AND DISPLAY | |
|---|---|
| - Actual cutting feedrate display | |
| - Alarm display | |
| - Alarm history display | |
| - Current position display | |
| - Periodic maintenance screen | |
| - Display of spindle speed and T code at all screens | |
| - Help function | |
| - Multi-language display | |
| - Operation history display | |
| - Parameter setting and display | |
| - Program comment display | 31 characters |
| - Run hours / part count display | |
| - Self-diagnosis function | |
| - Servo setting screen | |
| - Spindle setting screen | |
| - Status display | |
| - Operating monitor screen | |
| - Servo waveform display | |

| DATA INPUT / OUTPUT | |
|---|---|
| - External key input | |
| - External data input | |
| - External work number search | 15 points |
| - Memory card input/output | |
| - Reader/puncher interface | CH1.interface |
| - RS232C interface | |
| - Automatic data backup | |
| - Screen hard copy | |

| OTHERS | |
|---|---|
| - Cycle start and lamp | |
| - Display unit | 10.4" Color LCD |
| - Feed hold and lamp | |
| - NC and servo ready | |
| - PMC system | 31iA-PMC |
| - Reset / rewind | |

| INTERFACE FUNCTION | |
|---|---|
| - Ethernet function | Embedded ethernet |

| OPERATION GUIDANCE FUNCTION |
|---|
| - EZ Guidei (Conversational Programming Solution) |

## OPTIONAL SPECIFICATIONS

| AXIS CONTROL |
|---|
| - Stored stroke 2 and 3 |
| - Stroke limit check before move |

| OPERATION | |
|---|---|
| - DNC operation(Reader/puncher interface is required) | |
| - Manual handle feed | 2 units |
| - Manual handle interruption | |
| - Reference position shift | |
| - Tool retract and recover | |

| INTERPOLATION FUNCTIONS |
|---|
| - 3rd / 4th reference point reurn |
| - Circular threading |
| - Multi step skip |
| - Polygon machining with two spindle |
| - Variable lead threading |

| FEED FUNCTION | |
|---|---|
| - External deceleration | |
| - Feed stop | |
| - AI Contour control I (Look-ahead block no. is Max.30) | G5.1 Q1 |

## AUXILIARY / SPINDLE SPEED FUNCTION

| PROGRAM INPUT | |
|---|---|
| - Addition of workpiece coordinate system pair | 48 pairs |
| - Automatic corner override | |
| - Interruption type custom macro | |
| - Optional block skip (Soft operator's panel) | 9 pieces |
| - Pattern data input | |
| - Work coordinate system preset | |

| TOOL FUNCTION / TOOL COMPENSATION | |
|---|---|
| - Addition of tool pairs for tool life management | 128 pairs |
| - Tool offset pairs | 64 / 99 / 400 / 999 pairs |

| EDITING OPERATION | |
|---|---|
| - Number of registered programs | 1000 (512KB) ea |
| - Part program storage length | 1280 / 2560 / 5120 m |
| - Play back | |

| SETTING AND DISPLAY |
|---|
| - Directory display of floppy cassette |

| DATA INPUT/OUTPUT | |
|---|---|
| - Fast ethernet / Data server | Only for 1 path |
| - Remote buffer | Only for 1 path |

| ROBOT INTERFACE |
|---|
| - Robot interface with PMC I/O module} (Hardware between PMC I/O mudules) |
| - Robot interface with PROFIBUS-DP |

[ ] : PUMA 2100/2600 SY/LSY only

* : According to the business contract made Doosan, some regions have "Tool Load Monitoring system" as option.

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## DOOSAN-Fanuc i series

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| - Chamfering on / off | |
| - Cs contouring control | |
| - HRV2 control | |
| - Least input command | 0.001 / 0.0001 mm/inch |
| - Machine lock | All axis / each axis |
| - Mirror image | |
| - Overtravel | |
| - Stored pitch error compensation | |
| - Stored stroke check 1 | |
| - Chuck and tail stock barrier | |
| - Stored stroke 2 and 3 | |
| - Stroke limit check before move | |
| - Torque control | |

| OPERATION | |
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| - DNC operation (Reader / puncher interface is required) | |
| - Manual handle interruption | |
| - Reference position shift | |

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| - Constant surface speed control | |
| - M-code function | M3 digits |
| - Multi spindle control | |
| - Rigid tapping | |
| - S-code function | S4 / S5 digits |
| - Spindle serial output | S4 / S5 digits |
| - Spindle speed override | 0 - 150 % |
| - [Spindle sychronous control] | |

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| - Tool offset pairs | ±6 digits : 64 pairs |
| - Tool offset value counter input | |
| - Y-axis offset | |

| EDITING OPERATION | |
|---|---|
| - Number of registered programs | 400 ea |
| - Part program editing | |
| - Part program storage size | 1280m (512kB) |
| - Play back | |

| SETTING AND DISPLAY | |
|---|---|
| - Alarm history display | |
| - Multi-language display | |
| - Program comment display | 31 characters |
| - Run hours / part count display | |
| - Self-diagnosis function | |
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| DATA INPUT / OUTPUT | |
|---|---|
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| - Memory card input/output | |
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| - Automatic data backup | |
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| OTHERS | |
|---|---|
| - Cycle start and lamp | |
| - Display unit | 10.4" Color LCD |
| - Feed hold and lamp | |
| - MDI unit | |
| - NC and servo ready | |
| - PMC system | |

| INTERFACE FUNCTION | |
|---|---|
| - Ethernet function | Embedded ethernet |

| OPERATION GUIDANCE FUNCTION |
|---|
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## OPTIONAL SPECIFICATIONS

| INTERPOLATION FUNCTIONS |
|---|
| - Multi step skip |

| FEED FUNCTION |
|---|
| - Advanced preview control |

| TOOL FUNCTION / TOOL COMPENSATION | |
|---|---|
| - Tool offset pairs | 99 / 200 pairs |

| DATA INPUT / OUTPUT | |
|---|---|
| - Fast ethernet / Data server | Only for 1 path |

| ROBOT INTERFACE |
|---|
| - Robot interface with PMC I/O module (Hardware between PMC I/O mudules) |
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http://www.doosaninfracore.com/machinetools/


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- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan.